



2018 | REPORT TO CONGRESS ON

SUSTAINABLE RANGES

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Under Secretary of Defense
(Personnel and Readiness)

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Table of Contents

Executive Summary	I
1 Military Service Updates	1
1.1 Army	1
1.2 Marine Corps	5
1.3 Navy	10
1.4 Air Force	14
2 Special Operations Forces Training Requirements	19
3 Military Service Range Assessments	21
3.1 Assessment Methodology	21
3.1.1 Capability Assessment	21
3.1.2 Encroachment Assessment	22
3.1.3 Explanation of Individual Range Assessment Details and Observations	24
3.2 Assessment Results and Discussion	24
3.2.1 Army Range Assessments	25
3.2.2 Marine Corps Range Assessments	81
3.2.3 Navy Range Assessments	129
3.2.4 Air Force Range Assessments	255

4 DoD’s Comprehensive Training Range Sustainment Plan	375
4.1 Goals and Milestones	375
4.2 Funding.....	386
4.3 The Readiness and Environmental Protection Integration Program	389
4.4 Office of Economic Adjustment Compatible Use and Joint Land Use Studies Program	390
4.5 DoD Natural Resources Program	393
5 Evolving SRI Activities and Emerging Issues	395
5.1 New SRI-Related Influences and Actions	395
5.2 Electromagnetic Spectrum.....	395
5.3 Foreign Investment and National Security.....	396
5.4 Offshore Energy	397
5.5 DoD’s Long-Term Training Range Outlook	397
Appendix A Inventory of Ranges and Range Complexes, Special Use Airspace, and Military Training Routes.....	399
Appendix B Abbreviation List	495

List of Tables

Table 3-1	Army Capability Assessment Data Summary	26
Table 3-2	Army Encroachment Assessment Data Summary	26
Table 3-3	Army Range Capability and Encroachment Assessment Comparison.....	78
Table 3-4	Marine Corps Capability Assessment Data Summary	82
Table 3-5	Marine Corps Encroachment Assessment Data Summary	82
Table 3-6	Marine Corps Capability and Encroachment Assessment Comparison	126
Table 3-7	Navy Capability Assessment Data Summary	130
Table 3-8	Navy Encroachment Assessment Data Summary.....	130
Table 3-9	Navy Range Capability and Encroachment Assessment Comparison	252
Table 3-10	Air Force Capability Assessment Data Summary	256
Table 3-11	Air Force Encroachment Assessment Data Summary	256
Table 3-12	Air Force Range Capability and Encroachment Assessment Comparison.....	372
Table 4-1	Live Training Domain Actions and Milestones.....	376
Table 4-2	Electromagnetic Spectrum Actions and Milestone.....	384
Table 4-3	Foreign Access and Control Actions and Milestones	385
Table 4-4	DoD Range Sustainment Funding Requirements and Categories.....	386

Table 4-5	Military Service Training Range Sustainment Funding (\$M)	387
Table 4-6	Funding Fluctuation Explanation.....	388
Table A-1	Training Range Complex Inventory.....	411
Table A-2	Special Use Airspace Inventory.....	423
Table A-3	Military Training Routes Inventory	463

List of Figures

Figure 3-1	Army Capability Chart and Scores	26
Figure 3-2	Army Encroachment Chart and Scores.....	26
Figure 3-3	Army Capability Assessments by Range	27
Figure 3-4	Army Encroachment Assessments by Range	27
Figure 3-5	Army Capability Assessment by Attributes	27
Figure 3-6	Army Encroachment Assessment by Factors.....	27
Figure 3-7	Army Capability Assessment by Mission Areas	27
Figure 3-8	Army Encroachment Assessment by Mission Areas	27
Figure 3-9	Army Capability and Encroachment Assessment Detail	28
Figure 3-10	Marine Corps Capability Chart and Scores.....	83
Figure 3-11	Marine Corps Encroachment Chart and Scores.....	83
Figure 3-12	Marine Corps Capability Assessments by Range	84
Figure 3-13	Marine Corps Encroachment Assessments by Range.....	84
Figure 3-14	Marine Corps Capability Assessment by Attributes	84
Figure 3-15	Marine Corps Encroachment Assessment by Factors.....	84
Figure 3-16	Marine Corps Capability Assessment by Mission Areas	84
Figure 3-17	Marine Corps Encroachment Assessment by Mission Areas.....	84
Figure 3-18	Marine Corps Capability and Encroachment Assessment Detail	86

Figure 3-19	Navy Capability Chart and Scores	131
Figure 3-20	Navy Encroachment Chart and Scores	131
Figure 3-21	Navy Capability Assessments by Range	132
Figure 3-22	Navy Encroachment Assessments by Range	132
Figure 3-23	Navy Capability Assessment by Attributes	132
Figure 3-24	Navy Encroachment Assessment by Factors	132
Figure 3-25	Navy Capability Assessment by Mission Areas	133
Figure 3-26	Navy Encroachment Assessment by Mission Areas.....	133
Figure 3-27	Navy Capability and Encroachment Assessment Detail	134
Figure 3-28	Air Force Capability Chart and Scores.....	257
Figure 3-29	Air Force Encroachment Chart and Scores.....	257
Figure 3-30	Air Force Capability Assessments by Range	258
Figure 3-31	Air Force Encroachment Assessments by Range.....	258
Figure 3-32	Air Force Capability Assessment by Attributes	259
Figure 3-33	Air Force Encroachment Assessment by Factors.....	259
Figure 3-34	Air Force Capability Assessment by Mission Areas	259
Figure 3-35	Air Force Encroachment Assessment by Mission Areas	259
Figure 3-36	Air Force Capability and Encroachment Assessment Detail	260
Figure A-1	DoD Regional Range Complexes: Northeast.....	401
Figure A-2	DoD Regional Range Complexes: Southeast.....	402
Figure A-3	DoD Regional Range Complexes: Midwest – North	403
Figure A-4	DoD Regional Range Complexes: Midwest – South	404
Figure A-5	DoD Regional Range Complexes: Northwest.....	405
Figure A-6	DoD Regional Range Complexes: Southwest	406
Figure A-7	DoD Regional Range Complexes: Alaska	407
Figure A-8	DoD Regional Range Complexes: Hawaii.....	408
Figure A-9	DoD Regional Range Complexes: Europe	409
Figure A-10	DoD Regional Range Complexes: Asia	410

Executive Summary

This is the fifteenth Sustainable Ranges Report (SRR) to Congress, summarizing actions the Department of Defense (DoD) has taken to ensure the long-term sustainability of its training ranges. The SRR responds to Section 366 of the Bob Stump National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2003. The 2003 NDAA requires DoD to develop and submit to Congress a comprehensive plan to address training constraints caused by limitations on the use of available military lands, sea space, and airspace in the United States and overseas. Section 311 of the FY2013 NDAA extended the reporting requirement through FY2018.

Since 2001, the training and test communities, with the support of the installations and environment community, have worked together to address encroachment issues under the framework, termed the Sustainable Ranges Initiative (SRI). With the end of the Congressional requirement for this annual report, DoD will continue to address the challenges posed by encroachment on our training ranges, air and sea space, and electromagnetic spectrum, through new initiatives linked to the Secretary of Defense's 2018 National Defense Strategy (NDS). Training infrastructure must support the demands of our warfighters based on an increasingly complex operating environment. DoD's ability to field training capabilities while sustaining training enablers that support modern, representative training requirements across all domains is essential to pursuing the Secretary's first line of effort in the NDS: restoring military readiness while building a more lethal force.

While this report focuses on DoD training ranges only, it also touches on test and evaluation (T&E) ranges to the extent that these ranges support training activities. The DoD test community separately reports on encroachment factors affecting research, development, test, and evaluation activities in their Strategic Plan for DoD T&E Resources.

DoD has proactively addressed many of the challenges related to range capabilities and encroachment. Despite these efforts, certain issues remain, new ones emerge, and dynamic conditions and events exacerbate the original challenges. These challenges present common themes that resonate throughout this year's report and are highlighted as follows.

Summary of Identified Training Range Capability Issues

Fiscal constraints in previous years affected DoD and the Military Services through changes in force structure and significant reductions in funding for operations and maintenance (O&M), military construction (MILCON), research and development (R&D) investments, as well as acquisition programs. These limitations affected training range capabilities, both for conventional forces as well as Special Operations Forces (SOF). The Military Services identified significant challenges with both insufficient resources (e.g., training range lands, special use airspace [SUA], and electromagnetic spectrum) and insufficient equipment and systems that require updates to complete current training requirements. Also, DoD is facing the challenge of unmanned aircraft systems (UAS) training with their unique airspace requirements.

Summary of Identified Training Range Encroachment Issues

The Military Services continue to face encroachment challenges. These challenges include resident threatened and endangered species and species-at-risk management; incompatible development and land use adjacent to DoD training activities, to include foreign investment located in proximity to military training areas; increasing demand for energy development on the outer continental shelf; and the effects related to the reallocation of the electromagnetic spectrum as a result of the National Broadband Plan.

This year's report discusses the impacts of capability limitations and encroachment challenges in greater detail. The 2018 SRR provides Congress with updates to the 2017 SRR, and includes a comprehensive update to the individual training range capability and encroachment assessments for all four Military Services last reported in 2015. Additionally, the 2018 SRR includes the following:

- ▶ Critical range and training issues identified by the Military Services
- ▶ Current and future Military Service training range requirements
- ▶ Current SOF training capabilities, issues related to meeting training requirements, and future capabilities necessary for ranges supporting SOF training
- ▶ DoD's comprehensive training range sustainment plan
- ▶ A complete update to the range inventory

Every three years, the DoD provides Congress with a comprehensive update to the individual assessments with detailed data on encroachment and range capability factors affecting DoD. This year's report represents the fourth year in the cycle; the report last included assessments in 2015. The three-year cycle decision was based on the analysis that range capability and encroachment did not change significantly from year to year.

1 Military Service Updates

1.1 ARMY

The Army's 2018 range capability and encroachment assessments are included in Chapter 3 of this report. The discussion in this section highlights key issues and augments the range assessment information.

General Issues Related to Range Capability and Encroachment

The Army is addressing several critical and emerging issues regarding the operational and institutional live training environments. These issues impede the Army's ability to effectively and efficiently train combat-ready forces in accordance with the Army's Sustainable Readiness Model.

Critical Issues: Range Capability

General Mark A. Milley, the 39th Chief of Staff of the Army, has stated and continues to reinforce, "Readiness is number one, and there is no other number one." The Army's Sustainable Readiness Model and Objective Training standards meet the Chief's directive to maintain constant levels of readiness and to provide combat-ready units in response to the Nation's land force requirements. Live-fire ranges and training areas, including airspace, are critical enablers to achieve unit readiness.

Over the past decade, the US Army has taken risks in Range Operations manpower, relying on borrowed military manpower (BMM) from the units and Overseas Contingency Operations (OCO) funds to contract support for deploying forces. As the Army's deployment tempo has decreased, so have the OCO funds to support those deployments. These changes have significantly impacted the Army's ability to operate ranges. In addition, Army Command (ACOM) Commanders have determined using BMM to offset the manpower shortfall is no longer an acceptable option since it negatively impacts individual soldier and unit readiness. Installation Management Command (IMCOM) presented a

proposal to increase the number of Department of Army Civilian authorizations for Range Operations. The proposal included an additional 219 authorizations. Force Management approved the authorization increase for FY2019 and programmed additional funding to begin hiring against these authorizations in FY2018.

The Army has begun fielding the 5.56 millimeter (mm) enhanced performance round (EPR). The ballistics of this new small arms ammunition result in greater distance and ricochet angles, which in turn creates a larger surface danger zone (SDZ). Several Active and Reserve Component locations are unable to use this round because the new SDZ crosses installation boundaries or shuts down adjacent training areas when firing the 5.56mm EPR. The Army stopped production of the legacy 5.56mm round, reserving those in the logistics chain for installations experiencing these SDZ issues, and is developing mitigation measures that will enable those installations to safely use the 5.56mm EPR.

US Army Garrison Hawaii (USARHAW) is experiencing challenges with failing targetry at Schofield Barracks and long lead times for repair parts manufactured CONUS and in Europe. Target lifter downtime negatively impacts unit qualification training. USARHAW is mitigating this capability shortfall by relying on the capabilities at Pohakuloa Training Area (PTA). This mitigation strategy requires significant planning and use of Operations Tempo (OPTEMPO) funds to travel between the islands. The Sustainable Readiness Model and the Objective Training standard make the mitigation a challenge to implement, and the Army will consider programming a target refresh in the near future.

As the use of UAS to support units increases and matures, the need for restricted airspace over the training areas also increases. Most of the Army's restricted airspace is over dud-producing impact areas; however, realistic training events require much larger airspace than the current boundaries of

impact areas. This lack of restricted airspace causes scheduling challenges at several installations that could result in negative impacts to training if not rectified. Affected installations conduct National Environmental Protection Act (NEPA) assessments and submit appropriate requests through the Federal Aviation Administration to designate airspace over their training areas as restricted.

Summary of Major Changes in Range Capability

As mentioned in the previous section, live-fire ranges and training areas are critical enablers to individual Soldier and unit readiness. The Army continues to invest in range modernization through acquisition programs, operations and maintenance, and military construction funds. Among the various minor construction projects across the force, the Army scheduled the execution of four major construction projects in FY2018 that will significantly enhance range capability at those locations.

The Army is constructing an automated Qualification Training Range (QTR) at Fort Stewart, Georgia, and should be operational in FY2019. The Army will use this range to train and test individual Soldiers on the skills necessary to detect, identify, engage, and defeat stationary and moving infantry targets as well as stationary armor targets in a tactical array using various small arms weapons. All targets will be fully automated and the event-specific target scenario is computer-driven and scored from the fire tower. The range operating system will be fully capable of providing immediate performance feedback to the range users.

The Army is also constructing two infantry platoon battle courses (IPBCs): one at Fort Carson, Colorado and one at Fort Hood, Texas. These complexes will concentrate on unit tactical training, whereas the QTR is designed for individual Soldier training. Taking the skillsets developed on the QTR, the IPBCs will train and test infantry platoons, either mounted or dismounted, on the skills necessary to conduct tactical movement techniques. These range complexes will introduce the challenge of a moving armor target and will have the same automated target scenario capabilities, scoring, and feedback as the QTR.

The final Army MILCON project to be constructed in FY2018 will enable both individual and unit training. The live-fire exercise shoothouse being constructed at Camp Williams, Utah, will provide units with a facility to train and evaluate individual Soldiers and squads on tasks necessary to move tactically (enter and clear a room; enter and clear a building), engage targets, conduct breaches, and practice target discrimination in a live-fire environment. The shoothouse will be fully automated like the previously mentioned ranges.

Summary of Emerging Capability Issues

With the Army's renewed focus on a near-peer threat environment, the force structure is changing to enable more

robust armored force-on-force capabilities. The Army will establish a 16th Armor Brigade Combat Team (ABCT) and is currently evaluating the best location to station this ABCT. Range and training land capabilities will be evaluation factors in determining where to station; however, it is possible that enhancements to live-fire ranges or training area capabilities will be required at the selected installation.

The Army is currently testing a 7.62mm EPR, and as with the 5.56mm EPR, the Army anticipates challenges with increased SDZ footprints. This could create significant safety hazards at locations adjacent to the range and could reduce training capabilities due to SDZ overlap of other ranges and training areas. If the SDZ crosses the installation boundaries then the range would be unusable for the 7.62mm EPR until approved mitigation measures are put in place.

In the 2017 SRR, the Army identified an emerging issue regarding land leases with the state of Hawaii that are set to expire in 2029. The Army invested a significant amount of resources to enable live-fire and maneuver training on these lands. If access to these lands are not maintained after the leases expire the Army will lose considerable capability in the Pacific theater, including 24 percent of the overall range space in Hawaii. The Army is following the procedure to request a major land acquisition waiver (MLAW) from the Office of the Secretary of Defense to secure access to these lands beyond 2029. That access will enable the Army to continue range modernization plans to overcome existing live-fire range shortfalls at USARHAW.

Future Capability Outlook

The Army is moving forward with developing a range complex that will train and evaluate units, up to brigade combat teams (BCTs), on tactics within a dense urban terrain (DUT). A DUT is characterized as extraordinarily closely packed manmade infrastructure, both social and physical interconnectedness, and high population density. This would include concentrations of high-rise buildings, often with subterranean features, and densely packed shantytowns. The Army is considering the National Training Center (NTC) at Fort Irwin, California, for the location and is evaluating several options on how best to establish a DUT training site with the goal of beginning the construction phase in 2019.

As the Army returns to the large, force-on-force training scenarios, technological improvements in weapons systems and command and control capabilities have increased the operational footprint of a BCT. BCTs training at NTC are facing growing challenges maintaining doctrinal and operational distances. In addition, training staff at NTC are limited in their ability to provide variety and complexity in training scenarios. The Army is beginning preparatory work to open up the Western Training Area at NTC to enable combat support assets to operate from a close but not co-located position. This will provide more maneuver space for combat

arms units to operate and give training staff more options when building scenarios. Additionally, Special Forces units will be able to use the Western Training Area for environment and terrain specific training tasks.

Critical Issues: Encroachment

As the largest land-holding Military Service, the Army continually faces encroachment issues stemming from statutory requirements associated with the management of threatened and endangered species (TES) (Endangered Species Act (ESA)), cultural resources (National Historic Preservation Act), and wetlands (Clean Water Act). Significant strides have been made to reduce, off-set, or eliminate statutory driven management impacts to training, but TES and other resources continue to constrain maneuver land availability, range modernization, and Soldier training capability.

The red-cockaded woodpecker (RCW) management plan at Fort Bragg, North Carolina, is a prime example of how the Army continues to be stewards of the land and manages the delicate balance between training Soldiers and supporting critical species. The US Fish and Wildlife Service (USFWS) issued a 1990 Biological Opinion that identified the RCW as a species on Fort Bragg requiring protection. Training restrictions were implemented that significantly degraded training capability. Through vigilant management and coordination, Fort Bragg met the population recovery goal and many RCW-related training restrictions have been lifted. Similar to Fort Bragg, Fort Benning, Georgia is currently executing a management plan for RCW. The Fort Benning RCW management plan restricts mounted maneuver to the existing trails except within the Good Hope Maneuver Training Area (GHMTA).

Additionally, USARHAW is experiencing training impacts due to the presence of several listed plant species in the maneuver and live-fire areas. Units are restricted to maneuvering on existing trails, digging is not authorized in areas where endangered plants are present, and live-fire operations have been suspended at approximately 15 firing points.

USARHAW also faces encroachment from cultural resources management and stewardship of many Native Hawaiian sacred sites and other significant historic resources, including National Historic Landmarks on the islands of Oahu and Hawaii. On Hawaii, PTA faces training maintenance and access challenges. The Makua Military Reservation (MMR) on Oahu provides a Company live-fire exercise capability on Oahu, but the USARHAW has suspended live-fire at MMR for over 13 years due to legal challenges associated with USARHAW's management and considerations of cultural resources and sacred sites significant to Native Hawaiians. The Multi-purpose Range Complex on Oahu can also provide this capability; however, its footprint and SDZs require the closure of all other live-fire ranges during use. Units are mitigating by

traveling to the island of Hawaii and using the ranges at PTA; however, this utilizes OPTEMPO funds and increases travel costs associated with training.

Another encroachment challenge the Army faces is range transients. Fort Polk, Louisiana, has a large population of trespass horses and feral hogs in the training area. The trespass horses pose the greatest safety risk to training events on Fort Polk, particularly airborne and aviation operations on drop zones and helicopter landing zones. Fort Polk completed a NEPA study and the Commander made the decision to remove the trespass horses from the Army-owned lands. Despite this effort, reproduction rates remain high and the horses continue to pose safety risks. Additionally, a private citizen filed a complaint against the Army regarding the decision to remove the animals, and litigation is pending.

Summary of Major Changes in Encroachment Limitations

The Army continues to have great success utilizing the Army Compatible Use Buffer (ACUB) program and the Department of Defense's Readiness and Environmental Protection Integration (REPI) program. The Army uses the ACUB and REPI programs as avenues to protect against population encroachment, TES impacts, and future incompatible development projects. Just a few of the many examples of successes include Fort Bragg, North Carolina; Fort Carson, Colorado; and Fort Huachuca, Arizona. Fort Bragg partnered with local organizations through the ACUB program to improve and sustain TES habitat off the installation. This has both direct and indirect positive impacts on TES encroachment to training activities. Fort Carson used the ACUB program to prevent encroachment impacts due to adjacent land use. Communities near Fort Carson are aggressively promoting development, and Fort Carson recognizes the ACUB program as a vital tool to maintain training capabilities. Fort Huachuca partnered with the city of Sierra Vista through the REPI program to protect neighboring land parcels against development that could create competition for water and spectrum resources.

Summary of Emerging Encroachment Issues

As identified above, Army units are increasingly employing Unmanned Aircraft System (UAS) platforms to support ground troops. Civilian and commercial populations are also expanding their use of UAS, and installations are beginning to report spectrum encroachment issues. Fort Bliss, Texas, estimates the current allocated spectrum is about 70 percent of the future operational requirement. Fort Bliss must share frequency spectrum with Mexico, who has recently auctioned off frequency bands to wireless network companies, which negatively affects UAS operations. Fort Bragg has identified spectrum encroachment issues as well, stating frequency availability is limiting the number of UAS platforms that can fly simultaneously. Fort Carson, Colorado, is experiencing

spectrum encroachment from competing civilian activities. These are limiting the number of unmanned aircraft that can fly in designated areas.

Renewable energy projects provide alternatives to fossil fuel; however, they present potential incompatible development challenges to Army training, particularly aviation operations. Solar farms can cause glint/glare issues for aviation crews as sunlight reflects off the panel surfaces and can temporarily blind crewmembers. Wind farms pose several potential issues for aircrews. Aviation units are redirecting flight paths and altering training scenarios with respect to altitude parameters due to the height of the wind farm structures. Wind turbines also impact both Air Traffic Control (ATC) and National Weather Service (NWS) radar systems. ATC radar systems show a false positive at the location of each wind turbine. Software solutions allow these controllers to filter out up to 1,000 wind turbines, however it does so by telling the system to ignore the false positives and creates a “blind spot” directly above the wind farm up to 3,000 feet above ground level.

Army Service Special Interest Section

In the 2016 Sustainable Ranges Report to Congress, the Army acknowledged the initiation of a conservation crediting strategy aimed at protecting the Gopher Tortoise population in the Southeast United States. Over the past two years, the final Department of Defense Gopher Tortoise Conservation and Crediting Strategy codified the efforts of the Military Services, the USFWS, and four state wildlife agencies. The strategy was officially unveiled in March 2017 and formally established a conservation and crediting system for long-term protection and management of the Gopher Tortoise, an ESA-candidate species. The strategy is a proactive approach to conservation whereby military installations can attain ‘credits’ for establishing off-base Gopher Tortoise Conservation Areas (GTCA) in the event the tortoise is listed as an endangered species. The ‘credits’ can offset military training impacts to the Gopher Tortoise such as direct takes or impacts associated with on-installation development projects that encroach on tortoise habitat. This pre-emptive strategy is designed to promote efforts that may preclude the listing of the Eastern population of the Gopher Tortoise. At the same time, the crediting system allows military installations the ability to meet their testing, training, and readiness goals in the event the species is listed. This conservation and crediting strategy could potentially prove to be a roadmap for other ESA-candidate species and is innovative in its approach to meet the goals of both military training missions and species conservation.

Special Operations Forces Training Requirements

General Special Operations Forces Capabilities

Army Special Operations Forces (ARSOF) training is derived from AR 350-1, USASOC 350-1, and other Army Field

Manuals and Training Circulars. The tactics, techniques, and procedures (TTPs), standard operating procedures (SOPs), specific mission training, and some weapon systems are ARSOF unique.

During the past decade, U.S. Army Special Operations Command (USASOC) has experienced an increased growth in force structure and operational training requirements. While home-station training capacity has seen some improvement, many installations lack the space and resources required by ARSOF to conduct mission essential task list, pre-mission training, and task force training as required by the Joint Operations Readiness Training System. Additionally, increased formal qualification training requirements, new tactical ground mobility (TGM) capabilities, UAS, the frequent employment of precision munitions, and the rapid development of signals intelligence (SIGINT) and electronic warfare (EW) technologies have served to increase the need for larger, more diverse training areas, maneuver areas, and airspace necessary to support expanding ARSOF training requirements. Training facilities on DoD Installations are struggling to provide ARSOF with the complexity, accessibility, and efficiency required to adequately prepare our warfighters for combat operations.

Few training areas in the US are capable of addressing the large scale, full mission profile (FMP), live-fire requirements of ARSOF. Presently, most ARSOF are forced to travel away from home station to utilize facilities better suited to conduct their mission essential tasks and FMP exercises. The need to continually identify and coordinate adequate training venues with the appropriate maneuver space and air space is a recurring burden. Unit logisticians negotiate and coordinate a multitude of contracts, pay user fees, and purchase training or exercise support supplies, services, and equipment; as well as ship organic special-operations-unique weapons, vehicles, and equipment from home station to off-site locations.

The Army continues to establish regionally collective training capabilities (RCTCs). As a part of this effort the Army has identified four of the Army RCTCs (Fort Bliss, Texas; Fort Knox, Kentucky; Fort A.P. Hill, Virginia; and Yakima Training Center, Washington) as locations that will also include additional capabilities to support ARSOF training and readiness requirements. This effort should mitigate costs associated with pre-mission and sustainment training necessary to support USASOC. RCTCs with unique combinations of facilities and SOF-specific resources allow ARSOF warfighters to focus solely on meeting training requirements while reducing planning efforts and funding necessary to create an adequate training environment. RCTCs accommodate training for units as large as battalions and provide priority of use for the site’s ranges, training areas, and facilities. The deployment requirements for ARSOF are not decreasing, requiring the Army to sustain and expand the capabilities of these four ARSOF enhanced RCTCs. Fort

Knox is the preferred training location when home station training resources are constrained.

Critical Issues: Special Operations Forces Training Requirements

Installation managers endeavor to provide exceptional support to the ARSOF user; however, DoD-wide budgetary constraints and reductions in manning, services, and sustainment resources have been an issue. Resource restrictions not only affect improvements and future upgrades to facilities, but ultimately, sustainment and manning as well. Some installations have reduced the range operating hours and/or have required active duty “augmentees” from assigned units. Shrinking budgets will inevitably impact negatively on ARSOF as new technologies, weapons, munitions, and emerging ARSOF TTPs create new requirements and demands on installation range management resources. The range operations manpower increases in FY2019 should serve to lessen this impact and restore range capability and flexibility for ARSOF users.

Single-detonation net explosive weight (NEW) restrictions on some installations create limitations to the types of demolitions training that can be conducted. To ensure training related to heavy breaching and demolitions are performed per unit standards, the Army conducts some live demolitions training at nationally or civilian-operated facilities. Specifically, Fort Benning’s NEW restrictions of five pounds for single detonation require portions of the 75th Ranger Regiment’s Master Breacher Course which requires a NEW of 50 pounds plus. To meet Master Breach Course standards at Ft. Benning and JBLM, the 75th Ranger Regiment uses a local, civilian facility, near the installation, that allows the detonation of a NEW necessary to meet the MBC standards.

Future Capability Needs to Meet SOF Training Requirements

The advanced sniper rifle (ASR), which fires the .308, .300 WM, and the .338 calibers, generated a new requirement for sniper training. The Army designed a multi-purpose sniper range (MPSR) to meet this requirement. The MPSR is a 2,000-meter unknown distance range with a 1,600 meter known distance range collocated on the same site. Existing automated sniper field fire ranges and known distance ranges are limited to 1,000 meters. Due to SDZ requirements and proximity to impact areas, existing sniper ranges cannot be modified to meet training requirements, and many installations cannot support the MPSR. USASOC identified several locations for this training range. They identified Fort Knox for institutional training and submitted a MPSR for inclusion in the POM for FY2025. USASOC identified Yakima Training Center for operational training on the west coast. Currently Fort A.P. Hill and Eglin Air Force Base have the capability to support sniper operational training on the

east coast. The ASR is scheduled for fielding to USASOC units in FY2019 and conventional Army units in FY2020/2021.

1.2 MARINE CORPS

The Marine Corps’ 2018 range capability and encroachment assessments are included in Chapter 3 of this report. The discussion in this section highlights key issues and augments the range assessment information.

General Issues Related to Range Capability and Encroachment

The Marine Corps’ designed the Mission Capable Ranges Program (MCRP) to meet the guidance of the Marine Corps Service Campaign Plan (MCSCP). Marine Corps range program planners continue to build on this plan to identify ways to implement and develop training scenarios consistent with the Marine Corps Operating Concept (MOC), Marine Corps Vision and Strategy 2025, Expeditionary Force 21, and the Regional Range Complex Management Plans (Regional RCMPs). These plans accommodate current and future training scenarios that meet the expanded operating forces’ military mission footprint for readiness. Since no single military range complex encompasses the extent of land area, sea-space, and airspace necessary to replicate the extended complex modern battlefield, the Marine Corps frequently uses other Military Service range areas as well as training on or within the airspace above non-DoD lands (e.g., BLM, USFS, and USFWS) to conduct Marine Air Ground Task Force (MAGTF) training exercises. The MCRP provides the Marine Corps with a comprehensive, fully developed range program that defines current, emerging, and future range requirements.

The MCRP plans and executes range modernization and sustainment initiatives focused on the diverse training needs of the MAGTF. The cornerstones of the Program are:

- ▶ **Sustain Range and Training System Capabilities.** The Marine Corps has made significant investments in range and training area infrastructure in the past decade. Sustaining the capabilities that these investments provide is a foundational pillar of the MCRP.
- ▶ **Maximize Training Capacity.** The Marine Corps’ greatest challenge in supporting live training is providing sufficient land and air space to accommodate the requirements of modern weapons, tactics, and force structure. Effectively managing and operating Marine Corps Ranges is the key to maximizing capacity and training quality of the limited range resources.
- ▶ **Modernize Ranges.** Range modernization focuses on addressing gaps in range capability that negatively impact training, and providing capabilities to support emerging requirements of new systems or missions.

- **Preserve the Natural Environment and Mitigate Encroachment.** Marine Corps ranges are located in sensitive littoral and desert environments, and are among the most heavily encroached upon in the DoD. With a real estate portfolio already challenged to support the training requirements of modern weapons, tactics, and organizations, encroachment issues pose a significant threat to our training areas. Encroachment management seeks to prevent, repair, and mitigate these mission constraints to enhance the overall mission readiness of the Marine Corps while still meeting the requirements to preserve and sustain the natural environment.

The Marine Corps requires a substantial, ongoing commitment of resources and a portfolio of capabilities to support these cornerstones of training and readiness. Despite an uncertain fiscal climate, the Marine Corps has prioritized funding to ensure the sustainment of current range capability and capacity while selectively pursuing modernization to meet emerging operational requirements. The currently projected operating concepts outlined in Commandant's Planning Guidance (CPG) 2015, Marine Operating Concept, and MCSCP increase the number of essential missions that scalable MAGTFs and their component units must train for, and be prepared to execute. The broad spectrum of training requirements and greater capability of weapons systems increase the demand for ranges to support multiple training missions. This results in more intensive use of Marine Corps ranges for both individual and unit-level training, to include live fire and maneuver and amphibious operations.

To sustain range capability and capacity, the Marine Corps has increased participation in encroachment management partnerships, such as the Eastern North Carolina Sentinel Landscape designated on July 12, 2016. The Eastern North Carolina Sentinel Landscape allows for the purchase of easements surrounding Marine Corps training ranges in order to prevent encroachment and offers practical and permanent solutions to preserve training areas and airspace in Eastern North Carolina.

The requirements of a 21st century battle-space currently exceed the limitations of any single installation and demand for extensive training areas and airspace will continue to increase. The lack of adequate training lands and airspace will require range managers and Operating Force trainers to address training capability shortfalls with a mix of off-base solutions and regional training range capabilities. As the pace of combat deployments have diminished, the Marine Corps has experienced an increased demand on Marine Corps installations and ranges, other DoD installations, and non-DoD lands and airspace used for training.

In summary, the Marine Corps will require its installations and ranges to support training of Marines and Marine Corps units in a variety of mission-essential tasks that require

ever-increasing space and sophisticated range resources. The Marine Corps views ranges and training resources as part of an interdependent system of Marine Corps, DoD, and non-DoD resources, with the Marine Corps providing core ranges for live-fire and maneuver training, amphibious access, and mobility corridors for the projection of sea-based forces inland.

Critical Issues: Range Capability

The Marine Corps has previously identified Service-level deficits in its ability to train for the many missions necessary to maintain a well-trained force in readiness. While continued analysis and the fielding of new systems may identify new requirements, the Marine Corps has identified the following critical deficiencies associated with projected operational range requirements:

- Marine Corps ranges lack the capability to fully exercise a large MAGTF in a realistic, doctrinally appropriate training scenario. Specifically, the Marine Corps Air Ground Combat Center (MCAGCC) at Twentynine Palms, as the center of excellence for developing and executing combined arms live-fire training of the MAGTF, cannot accommodate a full-scale, live-fire Marine Expeditionary Brigade (MEB) exercise. The expansion of MCAGCC, made possible with significant congressional support, will correct this training and readiness deficiency and significantly enhance the Marine Corps' ability to provide fully-capable MAGTFs in pursuit of national security objectives. The Marine Corps is still negotiating issues with the airspace above the expanded lands, which limits their use. The I Marine Expeditionary Force (I MEF) successfully conducted a major large-scale exercise in the summer of 2017, with adequate land space for the size and scale of the exercise.
- Marine Corps units operating in the Western Pacific and Hawaii do not have adequate live-fire and maneuver training. Marine Corps ranges in Hawaii and Okinawa lack sufficient capabilities to fully support training for their assigned units. Consequently, these units must satisfy their training requirements on other-Military Service facilities, particularly U.S. Army ranges such as those at Schofield Barracks and the Pohakuloa Training Area in Hawaii, and the U.S. Air Force and Japanese ranges in Okinawa and mainland Japan. It is a constant challenge to schedule the various Military Service missions to ensure Marines and sister services all receive adequate training opportunities. Furthermore, training areas on Oahu and throughout Hawaii are subject to significant encroachment pressures from renewable energy development both on- and offshore, resulting in increased conflicts over the use of land, air, and seaspace. As some Okinawa-based forces relocate to Hawaii as part of the Defense Policy Review Initiative (DPRI) and the number

of operational flying squadrons at MCB Hawaii tied to the Marine Aviation Plan increase, it will exacerbate the conflicts in coming years. The DPRI includes relocating deploying units from Okinawa to Guam and developing associated basic training ranges and infrastructure. On Guam, individual Marine skills ranges are part of the Guam Supplemental Environmental Impact Statement (EIS). In a separate action, U.S. Pacific Command (PACOM), with the Marine Corps as executive agent, sponsored the Combined Joint Military Training (CJMT) EIS to address existing and future training deficiencies in the Western Pacific, specifically the Mariana Islands. The CJMT EIS effort is studying the possibility of developing new unit and combined arms training range capability and capacity in the Commonwealth of the Northern Mariana Islands (CNMI). These ranges and their associated airspace will provide the necessary training opportunities for Marines stationed in Okinawa and forward deployed to the Western Pacific. Finally, the Marine Corps is using training opportunities in Australia to address Rotational Force training requirements.

- ▶ The Marine Corps identified the need for an aviation training range on the East Coast of the United States capable of supporting precision guided munition training. Based on a thorough assessment of area capabilities, the Marine Corps publicly distributed a Final EIS for the Proposed Modernization and Expansion of Townsend Bombing Range in March 2013, selecting the expansion of Townsend Bombing Range as the best alternative for securing this East Coast capability. They signed a Record of Decision (ROD) to expand Townsend Bombing Range in January 2014. The Marine Corps submitted a formal airspace proposal supporting the land expansion to the FAA and acquisition efforts are underway. Due to refined projections for completion of real estate and funding actions, full operational capability is planned for December 2019.
- ▶ As affirmed in the MOC, the capability to fight from the sea and to operate within the littorals is a core Marine Corps competency. The Marine Corps, as an innovative, relevant, naval, expeditionary force in readiness, is committed to preserving and enhancing the capabilities of its primary amphibious training bases at Camp Pendleton and Camp Lejeune, and to developing opportunities for increased littoral training in Hawaii. The maneuver corridors, training areas, and airspace required to adequately support ground and air maneuver inland from landing beaches are severely constrained. Addressing these constraints with extensive, exercise-specific mitigation measures is a priority and is currently under study.

Summary of Major Changes in Range Capability

Changes in range capabilities tend to be incremental; therefore, any year-to-year changes in capability are generally minor and the Marine Corps has no specific changes to report. Major changes are likely to be apparent only in trends measured over multi-year periods or at the completion of major initiatives, such as the range expansions at MCAGCC and Townsend Bombing Range.

Summary of Emerging Capability Issues

An uncertain and potentially declining fiscal environment may affect the Marine Corps' ability to invest in required training infrastructure and to effectively manage its existing resources in support of training. In particular, fiscal constraints could restrict investment in new range capabilities needed to support training in advanced weapon systems. For example, in addition to expanding Townsend Bombing Range and establishing new SUA at MCAGCC, the Marine Corps is engaged in developing airspace access; landing zones; range support requirements to accommodate MV-22 Osprey and UAS capabilities; and in confirming range and airspace needs for the Joint Strike Fighter (JSF). The MCRP also plans to support increased immersive training opportunities that promote critical decision-making in realistic environments. The fielding of advanced range systems technologies are intended to include reactive robotic targets, video/audio capture to provide more accurate and responsive after-action review, multi-platform tracking systems that provide hyper-accurate position-location data, and an update of the combat marksmanship programs.

With Congressional support, the Marine Corps has invested over \$800 million in range capabilities over the past decade. The provision of modern, capable training ranges remains a Service priority as articulated in the MOC and the MCSCP. Funding priorities will remain focused on the sustainment and recapitalization of existing capabilities, and the currently projected level of FY2018 funding only meets the basic requirements of sustaining current capabilities. Without sufficient resources to support minimum maintenance and re-capitalization, today's range capabilities will become future liabilities and will adversely impact the ability of Marine Corps installations to support required training with mission-capable ranges.

Future Capability Outlook

The Marine Corps expects its range capabilities to continue to evolve in support of the tenets of the National Military Strategy, the CPG, MOC, and the MCSCP. Meeting the demands of the Operating Forces for ranges will require predictable and consistent funding for range sustainment and successful completion of critical projects to correct known training and readiness deficiencies. Failure to realize the objectives of key initiatives, including the expansion of Townsend Bombing Range, the inclusion of airspace over the

newly acquired lands in the Johnson Valley, the establishment of Guam/CNMI ranges, the further development of installation-level combined arms live-fire and maneuver space, and the reduction of constraints on amphibious landing beaches would introduce risks to the training enterprise that would require the Marine Corps to reevaluate the adequacy of range capabilities.

Critical Issues: Encroachment

Encroachment that constrains the use of Marine Corps ranges for realistic military training remains a significant concern. Marine Corps installations and ranges face continued population growth in surrounding communities, increased responsibilities under environmental regulations, and expanding development coupled with national emphasis on renewable energy generation and development. These elements generate pressure on scarce resources (land, airspace, water space, electromagnetic spectrum) critical to current and future military training, testing, and general mission activities.

The most significant encroachment issues at Marine Corps range complexes include effects on maneuver and live-fire training due to the presence of species listed under the ESA, restrictions on munitions, degraded access to the electromagnetic spectrum, noise-based restrictions on training, incompatible adjacent land use, and crowded adjacent airspace. Encroachment also impacts Marine Corps installations that do not provide significant range resources, but which are home to operational forces that use nearby training areas. Encroachment at these installations also affects training and mission readiness. Furthermore, the Marine Corps is heavily reliant on the other Military Service ranges, as well as non-DoD lands or “white space,” which are also subject to increasing development and other encroachment pressures.

The Marine Corps effort to mitigate impacts of encroachment on training, while still complying with applicable regulations, requires substantial resource commitment. Carefully monitoring federal, state, and local legislation and local development trends while ensuring strong community partnerships, the Marine Corps continues to address all areas of encroachment aggressively with focused programs, such as Encroachment Control Plans (ECPs), encroachment partnering (through the REPI Program), the DoD mission compatibility evaluation process for energy projects (through the DoD Siting Clearinghouse), Joint Land Use Studies, Air Installation Compatible Use Zone studies, and Range Compatible Use Zone studies, achieving notable successes. Nevertheless, the Marine Corps remains concerned that encroachment is a substantial threat to the capability of installations to perform their military missions.

Summary of Major Changes in Encroachment Limitations

Changes in encroachment impacts tend to be incremental. Major changes are likely to be apparent only in trends measured over multi-year periods or as the result of new regulatory initiatives, such as renewable energy, listing of species as threatened or endangered, or designation of critical habitat. The Red-Cockaded Woodpecker Recovery and Sustainment Program (RASP) at Camp Lejeune is a major step towards reducing the impact of federal requirements for a TES as the Marine Corps enters into land management agreements and conservation easements with surrounding State-owned properties. This agreement transfers a portion of the recovery goal for the installation to those properties in a joint venture between the State and the Marine Corps with the approval of the USFWS. This will expand options for new ranges to be developed as required on the installation without threat of a jeopardy determination for the species by the USFWS.

Summary of Emerging Encroachment Issues

Within Marine Corps Installations Command (MCICOM), the Government and External Affairs Directorate is responsible for encroachment management in support of mission requirements. This role is critical to Marine Corps operations and training as ongoing and emerging encroachment factors continue to challenge the capability of Marine Corps ranges to accomplish their mission. The increasing rate of renewable energy development in the vicinity of installations and training areas is a significant encroachment issue. Development of commercial wind, solar, and geothermal power and associated transmission infrastructure both on- and off-shore will require close attention, creative planning, and proactive effort to ensure the Marine Corps’ access to training areas in the air, on land, at sea, and within the electromagnetic spectrum is not degraded. This has been problematic for operations in eastern North Carolina, the desert southwest, the offshore areas along the west coast, and Hawaii. The nature of Hawaii’s location, geography, and the needs of its citizens combine to make competing land uses a challenging environment. Incompatible development due primarily to renewable energy development and the lack of landscape, critically threatens the Marine Corps’ ability to train in Hawaii. This concern is not limited solely to Hawaii. The Marine Corps will have to remain attuned to similar encroachment challenges at its other Pacific installations.

The Marine Corps is concerned that environmental effects could alter the capabilities of installations over time. Therefore, these risks must be analyzed, monitored, and addressed in installation planning. For example, Camp Lejeune has documented evidence of the progressive loss of its primary training beach due to storm surge and loss of barrier dunes.

Emerging encroachment issues have the potential to be exacerbated as new weapon systems enter the inventory and/or

re-deploy from combat. For example, the F-35, MV-22, KC-130J, and the burgeoning UAS inventory bring new capabilities to the Marine Corps that require greatly expanded training areas. Encroachment not only impacts access to existing training space, but also affects the ability of the Marine Corps to access the extended training areas and airspace necessary to train to standards using new systems and associated tactics and procedures.

Realistically, there are insufficient resources to acquire, through real estate and easement actions, adequate range capabilities and capacity for the Marine Corps' combined arms training needs. Range availability will, therefore, rely on mutually beneficial partnerships that support access to air, land, sea, and electromagnetic spectrum beyond range boundaries. As manned and unmanned warfighting platforms require increasing standoff distances, the Marine Corps must develop a more flexible approach to range planning. An impact area's use is diminished if it does not have tactical air, land, and sea approaches. A complete range capability requires maneuver space to ingress and egress the range; tactical approach corridors to training venues such as Military Operations in Urban Terrain (MOUT) and amphibious assault objectives/training venues; and air routes that support maneuverability and evasive actions, and munitions trajectory routes from significant distances away from their points of impact. The Marine Corps needs appropriate partnering that provides access to these critical spaces beyond range boundaries. These limitations will be a significant challenge in the years ahead. Partnering and leverage of existing range capabilities, such as in support of west coast amphibious and expeditionary force projection training requirements on San Clemente Island, will mitigate and partially address known deficiencies. Close coordination and expedited procedures with the FAA are necessary to ensure that the capabilities of aircraft and indirect fire weapons systems can be fully exercised by relinquishing airspace control for military operations when necessary.

Special Operations Forces Training Requirements

The information provided below outlines the Special Operations Forces (SOF) Training Requirements for the Marine Corps.

General Special Operations Forces Capabilities

In general, SOF units conduct individual and collective training on Marine Corps installations. This training includes small arms, heavy weapons, demolitions, sniper ranges, collective training, close quarters battle, urban, mounted and dismounted maneuver, call for fire, riverine and littoral training, aerial gunnery, and UAV platforms.

The Marine Corps has ensured that Marine Special Operations Command (MARSOC) has the same range access as Operational Forces on installations where it is a tenant unit.

Additionally, MARSOC and Naval Special Warfare (NSW) have priority status on specific ranges on the east and west coast.

Service specific training capabilities are to conduct direct action, special reconnaissance, counter terrorism, foreign internal defense, and preparation of the environment. These skills require significant training and refresh skills to maintain proficiency.

Critical Issues: Special Operations Forces Training Requirements

The suite of Marine Corps ranges supports SOF training requirements. However, given particular shortfalls, an installation may not meet specific SOF training requirements. For example, Camp Pendleton faces considerable challenges to meet the initial skill qualification training in high altitude low opening (HALO) parachute employment techniques due to high range utilization across the base and the entire training continuum.

The Marine Corps has provided target support to NSW elements at Chocolate Mountain Aerial Gunnery Range (CMAGR). They also provide additional support to 1st Marine Raider Battalion (1st MRB) elements for close quarters battle training (pistol and rifle ranges), and role player support for the Infantry Immersion Trainer at Marine Corps Base Camp Pendleton.

Future Capability Requirements to Meet SOF Training Requirements

The Marine Corps builds all ranges for conventional Operating Forces to maximize safety and Training and Readiness tasks and base personnel further ensure the safety of ranges by providing range certification and safety oversight. SOF elements train on Marine Corps ranges, and may request deviations from the installation commander for specific training requirements.

The Marine Corps has worked extensively with NSW to redesign the CMAGR Camp Billy Machen training ranges to better meet NSW training requirements. The Marine Corps continues to provide training ranges and areas support to SOF elements as requested. Since the completion of the *Report to Congress: Study on Training Range Infrastructure for Special Operations Forces* in 2012, the Marine Corps has provided support in the form of role players, target support, and range improvements.

SOF units will continue to use Marine Corps ranges in the future, and the Marine Corps looks forward to shared opportunities to hone the precision and lethality of conventional and non-conventional forces.

1.3 NAVY

The Navy's 2018 range assessments are included in Chapter 3 of this report. The discussion in this section highlights key issues and augments the range assessment data.

General Issues Related to Range Capability and Encroachment

The Navy is managing several issues regarding operational training range capabilities. The principle issues include modernization and sustainment of the training range complexes to support Fleet readiness training, development of live, virtual, and constructive (LVC) training capabilities, and mitigation of range encroachment factors.

Critical Issues: Range Capability

For the 2018 reporting period, the Navy's training range focus is on range modernization, specific improvements that contribute LVC training objectives, and improvement to live training environments.

Airspace and Impact Area Size Improvements

The Navy's multi-year process to renew land space withdrawals supporting the Fallon Range Training Complex (FRTC, *aka* Fallon range) and the El Centro Range Complex remains on track. Current withdrawals for both complexes expire in 2021 and it is critical that Navy is able to secure the required training space. Since last year's reporting, the Navy received approval from the FAA for requested airspace improvements and is implementing the changes to improve to Joint Military Service training.

In addition to sustaining the current withdrawal footprint at Fallon, the Navy is requesting a withdrawal expansion that will improve Strike Warfare training space. The objective improvements will add land and air space that enables more combat-like target engagement of land targets, enhance the security of training events, and increase the public's margin of safety near targets. A second facet of the FRTC's range improvements will withdraw additional land to accommodate Naval Special Warfare Command ground mobility training. Overall, the total FRTC improvements will incorporate the proposed sustainment of the FRTC's current land withdrawal, additional withdrawn land, and planned acquisition of private lands.

The El Centro withdrawal renewal sustains the existing land footprint that is home to air-to-ground weapons delivery impact areas supporting both naval student pilot training and Fleet strike warfare readiness. The withdrawal renewal is on track for inclusion in the FY2020 NDAA.

Significant growth in exercise volume and frequency usage in the Mariana Island Range Complex by Navy, Marine Corps, and Air Force combatant assets led to a PACOM sponsored SUA expansion plan submittal. All three Military Services

await FAA determination and approval of the proposed plan. Full implementation of PACOM's plan adding SUA is expected in FY2018.

Enhanced Live and Live Virtual Constructive (LVC) Training Capabilities

Navy on-range training capabilities are being targeted for improvement by an integrated requirements approach will establish a phased approach, over the FYDP, to the Navy's LVC training concept. The integrating process properly sequences requirements in improved networks, range instrumentation, and supporting capabilities as components of a LVC concept. In prior years reporting, live training range capabilities were documented as objectives for investment. Specific capabilities reported included the Hawaii Range Complex's permanent underwater range designated as Barking Sands Tactical Underwater Range (BARSTUR), Portable Underwater Training Range (PUTR), the Large Area Tracking Range TSPI instrumentation, and electronic warfare combat environments. The Navy has resourced those requirements in the most recent POM cycles in order to sustain critical live training capabilities and contribute to the LVC training.

Summary of Major Changes in Range Capability

The Navy noted no major changes for 2018 SRR reporting.

Summary of Emerging Capability Issues

During POM18, Navy analyzed the training range program with the objective of providing a current threat environment, modernizing and/or replacing legacy systems, and improving range space.

Future Capability Outlook

Current Navy range capabilities continue to support force readiness objectives for deploying units. On-going improvements in on-range capabilities and efficiencies from live and virtual advances will sustain training ranges support to combat forces' lethality.

Critical Issues: Encroachment

Critical issues identified in 2017 continued to be a concern during this reporting period. These issues include alternative energy development, candidate species management, competition for electromagnetic spectrum, foreign investment in the United States, and proliferation of ocean observing systems (OOS).

The Navy is developing guidance for conducting risk assessments to identify mission critical areas susceptible to encroachment based on foreign investment. This guidance will identify appropriate mitigations for at-risk locations, but will not override any existing security processes. The guidance will be an internal planning tool to focus Navy efforts.

Alternative and Conventional Energy Development

Alternative energy development and associated infrastructure present several compatibility issues related to radar systems and Navy activities performed undersea, on the water's surface, and in low altitude airspace. For alternative energy projects ashore, the Navy follows applicable law regarding energy siting negotiations with developers to ensure energy development does not significantly impact readiness. The Navy remains concerned with the potential impacts from wind turbine development on low-altitude airspace and airport surveillance radar used in support of readiness activities.

Conventional energy development such as offshore oil/gas development can interfere with at-sea training. Typically, this development places obstacles in areas where they impede ship freedom of movement. Ships must be able to maneuver freely to launch and recover aircraft and exercise tactical options during warfare training events. Infrastructure related to geothermal development can lead to training impacts by placing obstacles and obstructions such as steam, dust, and artificial infrared signals in paths of aircraft and maneuvering ground forces. The Navy utilizes available planning processes, laws and regulations to seek compatible siting for energy development; in particular for projects located on federal land, to include the outer continental shelf. Ongoing efforts to develop offshore energy continues to be a compatibility concern that could adversely impact Navy's ability to execute required training.

Candidate Species Management

In September 2016, the USFWS published a "not warranted" listing decision under the ESA for the Washington ground squirrel (WGS) based on Navy's ROD for proposed military readiness activities at Naval Weapons Systems Training Facility (NWSTF) Boardman, Oregon. The WGS was added to the USFWS's Multiple District Litigation Plan as part of a court-ordered settlement agreement. Some of the best remaining habitat of the WGS is located on NWSTF Boardman. Non-governmental organizations expressed concerns that any increase in ground-disturbing activities on the range will cause adverse effects to the species. The USFWS evaluated the Navy's proposed conservation efforts for the WGS under the USFWS' *Policy for Evaluation of Conservation Efforts When Making Listing Decisions* and determined there is a high level of certainty that the conservation efforts (*i.e.*, best management practices, mitigation, monitoring, and adaptive management) will be effective. Costs to implement conservation measures for basic species management include a minimum of \$1M to date, and approximately \$580K per year thereafter. Additional conservation costs (~\$2.76M) will be incurred when the Oregon National Guard implements their range enhancement and training activities. Range enhancements that will require additional conservation measures include the construction of a UAS airfield and

maintenance facility, multipurpose machine gun range, and two convoy live fire ranges.

Electromagnetic Spectrum Encroachment

The Navy faces challenges related to electromagnetic spectrum on multiple fronts. The National Broadband Plan seeks to reallocate spectrum for commercial uses, potentially impacting frequencies used by the military for training and testing. Additionally, individual projects have the potential to interfere with sensitive instrumentation and equipment used during training operations.

Foreign Investment in the United States

Foreign acquisition of resources or land/sea based assets in proximity to Navy ranges presents significant encroachment and range capability issues. Any development or investment near a critical training activity provides an opportunity for persistent visual and electronic observation of TTP training. Existing statutory mechanisms do not cover all categories of proposed transactions or projects required to protect training activities.

Proliferation of Ocean Observing Systems (OOS)

Non-military uses of OOS are increasing, such as marine mammal and weather research, climate research, tsunami warning/verification, and seismic/earthquake monitoring. The littoral nature of Navy training ranges and the unique environment make these areas valuable for data gathering using OOS equipment. The open nature of the high seas makes it possible for data gathered by OOS under innocent circumstances to be exploited as an operational vulnerability. When OOS encroaches upon Navy range complexes, Navy and national security interests are negatively impacted. This is an immediate concern at the Northwest Training Range Complex and expanded use of OOS could make other Navy ranges vulnerable to similar challenges in the future.

The Navy created an OOS Situational Awareness Office to improve knowledge about systems entering the water. Through this effort, the Navy will cooperate and consult with civilian agencies, foreign navies, academic institutions, and industry to build on current agreements and negotiate additional agreements to manage the placement of sensors and data sharing.

Summary of Major Changes in Encroachment Limitations

The Navy noted no major changes in encroachment impacts on individual ranges for the 2018 SRR. However, pressures related to offshore energy development, threatened and endangered species, munitions restrictions, electromagnetic spectrum encroachment, airspace restrictions, and adjacent

land use continue and are expected to continue for the foreseeable future.

Summary of Emerging Encroachment Issues

Homeland Defense Radar — Hawaii

One potentially significant encroachment challenge for the Hawaii Range Complex is the construction and operation of the congressionally-mandated Homeland Defense Radar - Hawaii (HDR-H) on Barking Sands or a PMRF Remote Site (Makaha Ridge). If operated 24/7 as the current CONOPS requires, the HDR-H will severely impact the scheduling and execution of all training and testing activities to the point that most activities currently conducted at PMRF will no longer be supported. Training and testing activities will require significant deconfliction with the HDR-H mission, as other Military Services training and testing programs require the PMRF instrumentation and surface/air space to meet their requirements.

Climate Impacts

The Navy is approaching weather impact challenges by modifying existing planning processes to include consideration of potential future impacts. These impacts have the potential to significantly affect Navy training and range infrastructure. Maintaining range resiliency in response to severe weather events is essential. For example, Hurricane Matthew caused severe damage to the Atlantic Undersea Test and Evaluation Center, Bahamas in 2016. Damage of critical facilities and loss of torpedo maintenance capabilities impacted submarine readiness training and command courses. Helicopter training, fixed wing training, and ship qualifications are currently partially mission capable, and support facilities require extensive repair.

Navy Special Interest Areas

The Navy and National Marine Fisheries Service (NMFS) developed science-based protective and mitigation measures that protect marine species while accommodating military readiness activities. The Navy continues to work with NMFS and other stakeholders to allow at-sea training while minimizing adverse effects to marine mammals.

Endangered species/critical habitat designation for the North Atlantic right whale created avoidance areas that resulted in reduced training days and certain training event exclusions. This current physical area is relatively small. However, if these types of restrictions were applied to protect other species and areas, there could be additional impacts on readiness training events.

The Navy continues to invest in marine mammal research, develop marine mammal mitigation measures based upon scientifically valid empirical data, and factor mitigation effectiveness into permit requests. Fleet training units will

adhere to these maritime protective and mitigation measures and the Navy will conduct outreach efforts for public education. The Navy's authorizations under the Marine Mammal Protection Act (MMPA) and ESA include an adaptive management approach to continually evaluate existing mitigation measures for their potential effects on training. The Navy will identify impacts on training from mitigation measures, document the impact, and raise issues with NMFS for resolution during the annual adaptive management review process.

General Special Operations Forces Training Capabilities

SEAL and Special Warfare Combatant Crewman (SWCC) continue to conduct live-fire training on Navy, Marine Corps, and Army ranges as well as property of other federal government agencies (e.g., U.S. Coast Guard, NASA, Bureau of Land Management [BLM]), as detailed in the *Report to Congress: Study on Training Range Infrastructure for Special Operations Forces* (2012). Critical SOF live-fire capabilities include the ability to provide assaults/urban operations ranges; land warfare static ranges/realistic live-fire and maneuver ranges; tactical ground mobility fire and maneuver ranges to support SOF vehicle platform mounted live-fire; ship to shore live-fire; over the beach (OTB) live-fire capability; advanced training ranges to support sniper/breaching; special operations craft-riverine live-fire ranges; and small arms/demolition/underwater demolition ranges to support basic underwater demolition/SEAL.

Unique Navy SOF capabilities include the need for ranges capable of performing underwater demolition and combat swimmer training, SEAL Delivery Vehicle Operations, unmanned underwater systems (UUS), and coastal and riverine combatant craft operations and live-fire training. The Navy integrates these unique Navy SEAL/SWCC range capabilities into the NSW MILCON plan designed to provide primacy and privacy in proximity to the primary NSWC home stations of Little Creek, Virginia; Coronado, California; Pearl City, Hawaii; and Stennis Space Center, Mississippi. Although these installations provide the required administrative support to the force structure of NSWC; they are limited in adequate battlespace for maneuver, restricted airspace needed to support UAS and/or Joint Terminal Attack Controller (JTAC) air/ground close air support (CAS), indirect fire systems, Anti-Armor live-fire, and ship to shore live-fire.

Critical Issues: Special Operations Forces Training Requirements

Individual Training Range Issues

Coastal urban development, private property, and environmental issues sustain constraints on OTB operations. Due to incompatible development, much of the remaining coastal environment for species to inhabit is land owned by

DoD. Habitat constraints from endangered birds like the snowy plover affect virtually every Southern California operational area at which OTB can be conducted. The presence of snowy plover habitat at Silver Strand and San Clemente Island can impact Special Operations in Urban Combat (SOUC) training. Through the Navy's successful efforts to improve the status of these species on Naval Base Coronado, the Navy has been able to retain training capacity at Silver Strand and decrease future training encumbrances by ensuring that the recovery of the plover population would not lead to ever-increasing off-limits areas on the training beaches.

The impact of the desert tortoise on training is minimal. Navy plans to re-configure ground ranges before 2025. The Environmental Assessment/FONSI signed in March 2016 and the Amendment to the 1996 Biological Opinion for the Chocolate Mountain Aerial Gunnery Range outlined measures to ensure minimal potential effects from training on the desert tortoise.

Mountain Warfare Training Camp Michael Monsoor is a former NASA tracking station with surrounding BLM land that the DON acquired through a land withdrawal for NSW training range use. Potential SDZ issues challenge Mountain Warfare Training Camp Michael Monsoor by extending into neighboring property. Most of the NSW West Coast assault-related training takes place at this installation.

Expansion of FRTC B-16 is essential so that NSWC has sufficient ground space for tactical mobility training. The FRTC land withdrawal effort includes expansion of B-16 to provide sufficient ground range area. In addition, expansion of NSWC ranges adjacent to Stennis Space Center is underway. Navy began acquisition of additional land through an approved MILCON land acquisition purchase. When successful, this will expand the range to about 5,000 acres. The expanded area will provide sufficient range space for riverine and associated training.

Infrastructure Sustainment

NSWC is dependent upon Commander Naval Installations Command (CNIC) and Marine Corps Installations Command (MCICOM) to provide maintenance and sustainment for facilities infrastructure (berthing, classroom, galley, armory, and storage) to support NSW range complexes on Navy and Marine Corps installations. Additionally, NSWC operates range complexes on non-Navy and Marine Corps installations; specifically Army, National Guard, Coast Guard, and NASA properties. As such, NSWC is the only SOF component of USSOCOM that maintains a Base Operating Support (BOS) budget to pay for support at these non-Navy and Marine Corps installations.

Major Advancements/Shortfalls

Since the 2012 *Report To Congress Study On Training Range Infrastructure For Special Operations Forces*, NSW constructed

new assault training facilities at Joint Expeditionary Base Fort Story Little Creek, Virginia, and Mountain Warfare Training Camp Michael Monsoor, California. These ranges consist of indoor close quarters combat (CQC) facilities. The Navy constructed these ranges to meet training and readiness objectives, to provide NSW with training locations closer to home station, and to provide NSW with the required primacy in range scheduling to support deployment schedules. The collective benefit of achieving those objectives is ownership and control of training schedules and reduction of the time away from home station during inter-deployment turn around.

Construction on an additional Special Operations Urban Combat facility at Fort Pickett, Virginia, is planned.

Future Capability Needs to Meet SOF Training Requirements

Unmanned Aircraft Systems

NSWC will work with the Navy to identify areas where UAS and UUS training can be accomplished. Modifying or establishing airspace over littoral, river and estuary environments is critical to parallel areas in which NSW doctrinally operates. Finding such usable airspace is challenging given airspace and other encroachment constraints.

Cyber

Ranges and OPAREAs must support Cyberspace Operations with the ability to develop TTPs as well as test and evaluate cyberspace capabilities particular to SOF operational environments.

Realistic Fire and Maneuver

The battlefield is an asymmetrical environment. Units must be capable of conducting full 360 degree live-fire events. NSWC will work with appropriate base staffs to ensure this training is safe and meets Operational Risk Management/Operational Risk Assessment guidelines.

Specifically, CONUS live-fire training capability is limited. NSWC Special Boat Teams must employ platform weapon systems in a littoral environment to maintain readiness. The limited availability of training area that do exist must be protected from encroachment. Conus OTB training capacity for live-fire is also limited. Urban encroachment, environmental and wildlife presence, and noise concerns to surrounding areas may degrade this capacity. This capability exists primarily at Fort Story, Virginia and San Clemente Island, California. The Navy will put emphasis on maintaining these areas as key OPAREAs for SOF units.

Ship to Shore Live-fire Capability

Ship to shore live-fire capability in CONUS is limited. NSWC Special Boat Teams must employ platform weapon systems in

a littoral environment to maintain readiness. Limited areas that do exist must be protected from encroachment.

Over the Beach (OTB)

OTB capacity in the Continental United States (CONUS) for live-fire training is limited. Since World War II, urban encroachment, environmental and wildlife presence, and noise concerns to surrounding areas have degraded this capacity. This capability exists primarily at Fort Story, Virginia and San Clemente Island, California. The Navy must maintain these areas as key OPAREAs for SOF units.

1.4 AIR FORCE

General Issues Related to Range Capability and Encroachment

The Air Force is addressing several critical and emerging issues regarding operational training infrastructure. Those issues include posturing for the current defense strategy, providing integrated, full spectrum training, enhancing the capability to support 5th generation aircraft and associated weapons systems, and integrating synthetic entities into live training.

Critical Issues: Range Capability

Posture for the Current Defense Strategy

The Defense Strategic Guidance requires the Military Services to refocus operations to counter a more technologically advanced peer adversary. These potential adversaries possess complex air defenses and highly sophisticated electronic countermeasures, including global positioning system (GPS) and radar jamming capabilities. The current Air Force range enterprise does not adequately replicate this environment. To provide the realistic training required for combat-ready aircrews, the Air Force is seeking to significantly upgrade range infrastructure at a few select ranges to accurately reflect the complex, dense combat environment crews will likely encounter during operations. These upgrades include realistic integrated air defenses, target arrays that challenge advanced sensors, high fidelity moving targets, and capabilities that simulate a contested and/or degraded environment.

Provide Integrated Full Spectrum Training

Air Force full spectrum operations rely on integrated air, space, and cyber capabilities. However, the Air Force's current ability to conduct cross-domain training in this environment is lacking. The training enterprise must evolve to incorporate full spectrum training to keep pace with the prominence of space and cyber capability. It is not currently feasible to provide full spectrum training at all ranges so the Air Force is evaluating enterprise options for locations that will meet this need and resource those ranges appropriately.

Enhance Capability to Support 5th Generation Aircraft and Associated Weapon Systems

The technological advances incorporated in 5th generation and 4th generation-plus aircraft and associated weapons represent an unprecedented leap in combat capability. These advances enable crews to identify and engage multiple targets from greater distances with improved accuracy. Precision guided munitions technology has generally shifted the focus of training from weapon employment to target identification, subsequently increasing the complexity of the targets required to accomplish realistic training. The greater employment distances of these weapon systems adds another stressor to range management as individual sorties require larger portions of the range and airspace to train safely and effectively. Consequently, the Air Force believes these advances will change the nature and balance of training. The diminishing requirements to drop live sub-scale and heavy weight munitions will increase the need to practice target identification. Additionally, the most advanced mission sets will likely take place in the simulator, further reducing the need for local range access. While TTPs for 5th generation aircraft are still evolving, the current trend indicates the focus of live training will move away from dropping sub-scale practice munitions on low-altitude ranges to medium- to high-altitude sorties that will require larger volumes of airspace.

Integrate Synthetic Entities to Enhance Live Training

Historically, units used virtual capabilities to accomplish basic training tasks while accomplishing all complex training in the live environment. The complexities of new weapon systems and operational security concerns drive the most complex training into the synthetic environment. As the Air Force develops programs of record for synthetic training, it is imperative for the range enterprise to incorporate these abilities into the live domain (i.e. blended training).

Summary of Major Changes in Range Capability

On October 1, 2017, the ANG transferred operation of Townsend Bombing Range to the Marine Corps.

Summary of Emerging Capability Issues

The Air Force has no emerging capability issues to report in the 2018 SRR.

Future Capability Outlook

The outlook for future Air Force range capabilities is mixed. The Air Force is currently pursuing several programs of record that will expand training capabilities. These programs include procurement of new advanced threat radars/simulators, upgrades of select legacy threat systems, and development of a realistic and secure synthetic-to-live/live-to-synthetic capability. These investments in advanced technology will

greatly enhance the ability to provide relevant and realistic training to ensure combat ready crews. However, as Air Force ranges advance technologically, they are increasingly constrained geographically.

Currently, the Air Force is only able to emulate a fraction of existing and emerging threats to a level suitable for advanced sensors, and cannot provide a contested/degraded environment with the threats available. To achieve full-spectrum readiness *via* daily training and large force exercises, the Air Force must be able to replicate a representative cross section of all potential threats that are expected to make up near-peer adversaries' Integrated Air Defense System (IADS). There are several efforts underway to address the threat capability gap across the range enterprise. Additionally, the Air Force cannot afford to equip each range with the threats necessary to replicate a near-peer adversary's IADS. For this and other reasons, the Air Force is adopting a regionalization concept to organize and guide future range investment and use.

The Air Force acknowledges that a realistic training environment requires targets on which to employ both kinetic and non-kinetic effects. The Air Force is working toward providing units access to targets appropriate for tactics training and sensor employment. A percentage of targets need to be of sufficient fidelity to be operationally representative in terms of their visual, electro-optical, infrared, electromagnetic, synthetic aperture radar, and cyberspace signatures. Camouflage, concealment, and deception targets also need to be available. In locations designed for multi-domain training, these targets must be targetable by air, space, and cyberspace capabilities in a realistic manner.

The Air Force understands that realistic live training events require access to adequately sized SUA. In many cases, the Air Force's SUA was designed to support the training needs of aircraft that are no longer in the inventory and with a single aircraft mindset, so it is undersized for current and future weapon platforms operating in a multi-aircraft environment. Efforts are underway to regionally realign the airspace to better accommodate current and future training requirements and facilitate efficient use of the National Airspace System.

Critical Issues: Encroachment

The airspace database that supports the FAA's Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) Process was updated to incorporate major revisions to range airspace. However, the FAA contractor is still working to complete database updates fundamental to the notification and analysis process. Until the FAA contractor database updates are complete, proposed wind turbine development projects adjacent to Air Force ranges that require FAA approval with DoD review for mission impacts are at risk of receiving FAA approval without adequate Air Force review.

As the number and size of wind turbines in the United States is expected to grow significantly over the next half century, so could their effect on range flight safety, mission execution, and supporting weather forecasting. The next generation of taller wind turbines, with blade tip heights reaching over 600 feet, are beginning to arrive near installations and underneath low-level training routes that Air Force uses to transit into ranges. Air Force operations and training leaders are at preliminary stages in assessing the impact of this new challenge.

To address the continuing degradation of airport surveillance radar coverage caused by construction of wind turbines within the radar line of sight, the Air Force continues to partner with the FAA to conduct analyses of alternatives. The analyses are being constructed as a Pilot Mitigation Project with funding from the DoD-led Interagency Wind Turbine Radar Interference Mitigation Senior Steering Group.

Summary of Major Changes in Encroachment Limitations

The Air Force has no major changes in encroachment factors impacting individual ranges to report. The Air Force is actively involved with the Office of the Secretary of Defense (OSD) and the Military Services in addressing impacts and mitigation options for development-related encroachment issues near both Air Force and joint-use ranges.

Summary of Emerging Encroachment Issues

In 2017, several foreign owned or controlled corporations made purchase proposals for facilities within monitoring proximity of Air Force ranges, introducing unknown levels of risk. The Committee on Foreign Investment in the United States (CFIUS) process continues to be an important resource for ensuring the security of the range missions.

Air Force Special Interest Areas

The Air Force is working in support of the OSD/Chief Information Officer's task to review L-Band spectrum for potential auction for sharing with commercial industry in a program called Spectrum Efficient National Surveillance Radar (SENSR). Among other spectrum tasked for review, the L-Band 1300–1350 bandwidth is critical for testing and operational training on Air Force ranges. In-depth DoD studies will support an OSD follow-on determination of the risk to joint missions, to include risk to ranges.

Special Operations Forces Training Requirements

While many Air Force ranges may have limited capability to provide SOF-related training, Melrose Range is the only one designated to provide SOF-specific training. Air Force Special Operations Command (AFSOC) manages and funds the Melrose Range. Melrose Range provides training support for the following missions: precision strike, specialized mobility,

intelligence, surveillance, and reconnaissance (ISR), and special tactics.

General Special Operations Forces Capabilities

Melrose Range consists of 70,978 acres in east-central New Mexico. SUA, primarily military operations areas (MOA), overlies lands around Melrose Range. The Air Force uses most of the land below the MOAs, restricted areas, and military training routes (MTR) as rangeland and for crop agriculture.

Melrose Range is the primary training range for the 27th Special Operations Wing (27 SOW) and the 26th Special Tactics Squadron (26 STS) and supports AC-130, MC-130, C-146, U-28, MQ-9, MQ-1, and special tactics mission training. Additionally, the 27 SOW hosts a USASOC, Joint Ground Liaison Office (JGLO) at Cannon AFB. The JGLO conducts classes supporting advanced training for SOF with AFSOC precision strike, specialized mobility, ISR, and special tactics missions.

Several Air Force units are primary users of Melrose Range, including B-1 bombers from the 7th Bomb Wing, 53rd Wing, and the USAF Weapons School; as well as B-52 bombers from the 2nd Bomb Wing. While not assigned as primary users of Melrose Range, E-3 aircraft from Tinker AFB and RC-135s from Offutt AFB frequently train on the Melrose Electronic Warfare Range.

The Melrose Range Support Complex includes manned target scoring, fire emergency services, range communications, equipment and vehicle maintenance, target construction and storage, and other administrative functions. Melrose Range impact areas support inert practice bombing and inert and live direct-fire gunnery practice. Several manned electronic warfare training facilities are located on Melrose Range. Specifically, Melrose Range contains:

- ▶ Two explosive impact areas for AC-130 live-fire and other SOF air/ground weapons employment,
- ▶ Eight additional ranges for ground-ground direct and indirect fires
- ▶ Thirteen discreet training areas
- ▶ Three observation posts
- ▶ Five mortar points
- ▶ Seventeen drop zones
- ▶ Thirty-five helicopter landing zones
- ▶ Three semi-improved landing zones

Critical Issues: Special Operations Forces Training Requirements

In 2007, the Air Force transferred the Melrose Range from Air Combat Command (ACC) to AFSOC, and in doing so shifted

Melrose Range's training mission from supporting fighters and bombers to primarily supporting integrated air-to ground training for SOF. Melrose's shift to SOF training required a reconfiguration of the range infrastructure. AFSOC and USSOCOM have invested \$43M in Melrose Range since 2007; however, the range requires additional enhancements to provide high fidelity SOF training. In Melrose's current configuration, the range control tower, administration, maintenance, fire, and assorted storage facilities are located in the middle of the range. This impedes efficient, simultaneous training operations and creates additional residual risk when conducting integrated training.

AFSOC is investing \$15M in projects that replace and relocate outdated range facilities to the Northwest Development Area (NWDA) at Melrose Range. NWDA construction began in FY2012 with the fire vehicle storage, mission rehearsal, and latrine facilities; however, these projects were constructed without adequate infrastructure in place. AFSOC aggressively pursued programming and execution of additional funds to solve the infrastructure deficiencies. In FY2016, AFSOC completed a water well and distribution line to the Permanent Exercise Complex (PEC) and will award a treatment plant with distribution piping to the Range Support Complex (RSC) which is scheduled to be completed in FY2019. AFSOC constructed two miles of roads in FY2016 and planned an extension of commercial power lines and installation of communication infrastructure for FY2017/18. The relocation project to the NWDA necessitates construction of a new main entrance for the range to allow access to the new RSC without crossing the center hazard areas. This requires improvements to the State Highway 84 turnoff and extensive refurbishment of the five miles of public road to the new entrance. AFSOC initiated a Defense Access Roadway (DAR) project to support this effort with an undetermined execution year at this time.

AFSOC funded projects supporting the relocation of the control tower, administration/operations building, maintenance facilities, a new Joint Operations Planning Facility, a de-mil facility and a landing zone/drop zone (LZ/DZ) target facility with a schedule to complete by 2018. AFSOC identified funding for a firefighter bunkhouse in the FY2019 Air Force Unspecified Minor Military Construction (UMMC) Program.

Future Capability Needs to Meet SOF Training Requirements

In order to support future training needs, the command is scoping a requirement to convert one of the three dirt, semi-prepared LZs to a hard surface that will support C-130 and U-28 missions as well as expeditionary operations for the MQ-9 Reaper. The current semi-prepared LZ requires extensive maintenance and cannot support direct infiltration of training forces to the range. The Air Force will submit the MILCON proposal for consideration during the FY2021

budget planning cycle. Long-term plans for Melrose Range include adding the capability to support training in contested/degraded environments and to provide more realistic training for aircrews employing powered weapons; however, the Air Force has not yet developed or validated specific requirements and range changes/improvements needed to execute these plans. There are currently no known or anticipated delays in completing the planned and funded actions at Melrose Range previously described.

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2 Special Operations Forces Training Requirements

In response to the 2017 NDAA Senate Report 114-49, DoD continues to report on SOF training capabilities, critical issues related to meeting SOF-specific training requirements, and future capability needs to meet training requirements. The previous chapter showcased the Military Service-specific issues; this chapter provides Department-wide information.

SOF Training Capabilities

Improvements in SOF training capabilities have been significant and are part of a larger effort to meet both Military Service and SOF training requirements. The improvements also directly support USSOCOM's Preservation of the Force and Families (POTFF) initiative by providing increased training capability or a consolidated training capability closer to home station and decreasing time away from home. However, service budgets continue to threaten this progress. Decreased budgets have forced many of the Military Services to reduce or eliminate training range modernization and recapitalization programs and to reduce sustainment and operating funds. These budget reductions can negatively affect both Military Service and SOF's ability to train, thereby affecting overall readiness.

SOF required training ranges should be designed to support Full Mission Profile (FMP) training events. In general, these events are made up of several conventional and SOF specific capabilities: small arms, heavy weapons, grenade and explosive ranges; live-fire convoy and maneuver training; fixed and rotary wing aerial gunnery ranges; single-story and multi-story shoot houses; and tactical and non-tactical vehicle driving courses. These ranges must be available 24/7 to accommodate SOF's training requirements, including during the hours of darkness and limited visibility.

Because USSOCOM does not own and operate any training ranges, SOF rely on Military Service-owned ranges and training areas to meet their training requirements. The Military Services' training range infrastructure must support a

broad range of mission essential training requirements for both the Military Services and those of SOF. Operational demands placed on SOF are expected to increase across the next decade, and beyond. To meet this demand, the Military Services and USSOCOM will continue to work together to maintain and improve the capabilities of training ranges.

Critical Issues Impacting SOF Capabilities

DoDs continued fiscal constraints are the greatest challenge affecting the availability and sustainability of the existing training ranges used by SOF units. It is also difficult to the support full spectrum operations and accomplish FMP live-fire exercises due to the size and number of training ranges required to support these exercises. SOF home stations do not have requisite ranges or maneuver space to support the requirements of FMP live-fire exercises. This results in SOF units traveling to train at the few ranges capable of supporting FMP live-fire exercises. Ranges with adjacent federal lands provide accessibility to non-live fire training. The BLM policy of "Casual Use" allows for non-live fire training while simultaneously protecting the public and environment.

Military Service training ranges continue to increase their ability to support and facilitate SOF training. A lack of adequate maneuver space, however, limits their ability to provide complete and full support for a SOF FMP exercise. Many of the ranges where SOF units prefer to train have reached their limit of expansion and the Military Services cannot acquire the additional resources necessary to accommodate FMP live-fire exercises that use UAS, ISR, and live-fire close air support (CAS).

SOF also conduct training on test ranges. This poses additional, unique challenges because training ranges and test ranges operate using different business models with competing priorities. Training ranges are funded to support training free of charge while test ranges operate on a fee-for-service business model. Therefore, because the test range's primary mission is

to support weapons testing, scheduled ground and air tactical training events may be canceled due to higher priority emergent test requirements. While Major Range Test Facility Base (MRTFB) activities such as the Eglin Test and Training Complex, Naval Air Weapons Station China Lake, Dugway Proving Grounds, Nevada Test and Training Range, and White Sands Missile Range attempt to minimize impacts to training missions when this occurs, it remains a SOF concern.

Incompatible land use and its impact to Military Service training ranges directly affects SOF training capabilities. Civilian encroachment on installation and range boundaries is a significant threat to SOF missions and tactics and operations. USSOCOM continues to work with OSD and the Military Services to address encroachment. However, most military ranges are cooperative when it comes to increased security and enhanced Operations Security (OPSEC) measures associated with SOF operations.

Future SOF Capability Requirements

The Army continues to establish RCTCs and has identified four of the Army RCTCs (Fort Bliss, Texas; Fort Knox, Kentucky; Fort A.P. Hill, Virginia; and Yakima Training Center, Washington) as locations that will also include additional capabilities to support ARSOF training and readiness requirements. This effort will enhance existing capabilities with interoperable training facilities, live-fire facilities and maneuver ranges, and advanced urban operations training facilities, and will provide SOF with advanced training opportunities. Constructing facilities at these select locations to support training carries a heavy price tag, and budget reductions have already threatened progress. RCTCs also support the POTFF initiative by providing turn-key training opportunities that reduce time away from home station by reducing logistical support requirements. The Military Services' continued support of SOF accessibility and priority use of ranges funded by MFP-11 must be transparent to the Service Installation Management Command (IMCOM) and embedded in future Memorandums of Agreement for those installations to ensure success.

USSOCOM continues to explore the use of technology to meet SOF training requirements. The Assistant Secretary of Defense for Special Operations/Low Intensity Conflict and Interdependent Capabilities (ASD/SOLIC-IC) Technical Support Working Group (TSWG) has supported USSOCOM's efforts to simulate the full spectrum of threats and contingencies. TSWG supported research, development, test, and evaluation projects have provided SOF units with state of the art virtual immersion technology to support training requirements. Continued TSWG support will provide additional capability to meet SOF training requirements through virtual simulation.

Other future training requirements and capabilities will be influenced by the operating environment. While SOF deployments to Afghanistan are expected to continue, SOF is also focusing its attention on Africa and the Asia-Pacific region. Because these regions are distinctively different from those experienced in Afghanistan, SOF needs to train in similar environmental conditions (e.g., jungle ranges and ranges that border water) for live-fire, tactical movement, and resupply in training as they would on deployment.

3 Military Service Range Assessments

NDAA Section 366(a)(2)(B) requires DoD to evaluate the adequacy of current range resources. Additionally, NDAA Sections 366(c)(1)(B) and (C) require DoD to identify training capabilities and existing constraints.

In response, DoD developed a process to evaluate whether an individual range is capable of providing the required training support and how encroachment is impacting the ranges assigned training mission.

In 2007, DoD began assessing the adequacy of ranges to support required training as well as the actual impacts of encroachment. In 2008, DoD and the Military Services worked together to build a common set of capability attributes, encroachment factors, and standard evaluation criteria for the purposes of this report. Use of common attributes, factors, and standard evaluation criteria led to a consistent assessment and analysis across the Military Services. The 2018 updated range assessments are included for each Military Service in this chapter.

3.1 ASSESSMENT METHODOLOGY

DoD continued to improve its methodology for assessing range capabilities and encroachment. Beginning in 2008, DoD used 13 common capability attributes and 12 common encroachment factors to create a unified reporting and analytical framework that integrates data from each of the Military Services. The Military Services are responsible for providing data on capability and encroachment on an annual basis.

The reporting and analytical framework along with the 13 common capability attributes remain unchanged in the 2018 SRR. However, the DoD and Military Services re-evaluated the list of encroachment factors in 2017 after reviewing historical trends in reporting and identifying new forms of encroachment impacting DoDs training ranges. The result was a revised list of 9 common encroachment factors detailed in Section 3.1.2.

3.1.1 Capability Assessment

Beginning in 2008, the Military Services developed and identified the following 13 common capability attributes for the range assessment and reporting processes:

- ▶ **Landspace**—Physical land area that has the necessary features, such as topography, vegetative cover, configuration, proximity, capacity, usability, and acreage.
- ▶ **Airspace**—Physical volume of airspace that has the necessary features, such as types of use, configuration, proximity, capacity, and amount.
- ▶ **Seaspace**—Physical sea-surface area that has the necessary features, such as types of use, configuration, proximity, capacity, and amount.
- ▶ **Underseaspace**—Physical volume of underseaspace that has the necessary features, such as ocean bottom type, depth, types of use, configuration, proximity, capacity, and amount.
- ▶ **Targets**—Various land, air, sea, and undersea presentations designed for live or simulated weapons engagement.
- ▶ **Threats**—Various physical and simulated threat presentations, such as emitters, opposing adversary forces, and battlefield effect simulators.
- ▶ **Scoring & Feedback Systems**—Equipment that provides information for training event reconstruction, debriefing, and replay, whether virtual or live, through the collection and storage of time space position information (TSPI), weapons accuracy, systems and operator accuracy, assessment and monitoring of operator performance, and command, control, communications, computers and intelligence (C4I) network information flow.
- ▶ **Infrastructure**—Buildings, structures or linear structures (e.g. roads, rail lines, pipelines, fences, pavement).

- ▶ **Range Support**—Personnel, software, and hardware that support such functions as daily range operations, maintenance (including range clearance), and communication networks for Command and Control, scheduling, and range safety. Communications networks include: inter and intra-range systems; point-to-point; range support networks; fiber optic and microwave backbones; information protection systems (e.g., encryption, radio, data link); and instrumentation frequency management systems.
- ▶ **Small Arms Ranges**—Ranges that accommodate weapons systems firing rounds up through 40mm and produce duds.
- ▶ **Collective Ranges**—Ranges that provide proficiency at the team or unit level for battlefield operations.
- ▶ **Military Operations in Urban Terrain (MOUT) Facilities**—Terrain complexes that replicate urban environments.
- ▶ **Suite of Ranges**—A nominal make-up of range attributes, intended to provide the baseline requirement for each level of training. The elements include various types of ranges such as maneuver/training area, impact areas, live fire ranges, aviation ranges, and MOUT complexes that must be coordinated to conduct required training events.

The Military Services assessed and evaluated their specific mission areas against these 13 capability attributes for accessibility and usability during normal operations using the following color rating scheme:

- ▶ **Red**—The range is not mission capable. It is unable to support required training tasks for a given mission area to prescribed doctrinal standards and conditions.
- ▶ **Yellow**—The range is partially mission capable. It can partially support required training tasks for a given mission area to prescribed doctrinal standards and conditions, resulting in marginalized training for the range users.
- ▶ **Green**—The range is fully mission capable. It can support required training tasks for a given mission area to prescribed doctrinal standards and conditions.
- ▶ **White (Blank)**—White (blank) represents a situation where an assessment for a given mission area is not performed against a particular attribute. If a complete mission area is “white,” there is no requirement for the range to provide training in this area. When conducting the encroachment assessment for this same range, no encroachment factors will be assessed for this mission area.

3.1.2 Encroachment Assessment

Measuring the impact of encroachment on mission readiness can be difficult. Encroachment causes range users to find workarounds to complete required training. While some adaptation by the Military Services’ operational forces can be expected, excessive workarounds resulting from encroachment can increase mission risk due to unrealistic, segmented, or irrelevant training, and may result in a deterioration of training content and/or quality.

Just as impacts from encroachment tend to improve and degrade over time, new forms of encroachment can emerge and existing forms of encroachment can evolve in definition. In 2017, the DoD and the Military Services participated in a collaborative effort between the training and testing communities to re-evaluate the list of common encroachment factors that are assessed in the SRR and reports developed by the test community. This evaluation determined that encroachment factors such as munitions restrictions, air quality, noise restrictions, water quality/supply, and wetlands, individually represented a small impact on training and overall encroachment scores. To minimize reporting requirements and group like-factors, the evaluation consolidated these encroachment factors into one factor titled “other regulatory requirements.” The evaluation also identified the need to report on new, emerging issues. DoD added two new encroachment factors to the evaluation: climate impact and foreign access and control.

As part of the effort to standardize the assessment of encroachment on training ranges, the DoD tasked the Military Services to assess the current impacts of the following 9 encroachment factors against their Military Service mission areas.

- ▶ **Airspace**—Constraints placed on training due to the availability of airspace; these constraints may be spatial or temporal.
- ▶ **Climate Impacts**—Constraints placed on activities or ranges (both short and long-term) due to impacts of a changing climate. Examples include natural disasters, coastal erosion, invasive species propagation, sea level rise, drought, wildfire, changes in land cover vegetation, wetlands, or shifts in candidate, threatened, endangered, or at-risk species habitats.
- ▶ **Foreign Access or Control**—Constraints resulting from the presence of foreign investment in proximity to activities and ranges which presents a potential threat to national security through persistent surveillance or interference opportunities.

- ▶ **Land Use**—Constraints placed on activities and ranges due to incompatible development in proximity to military activities and ranges. Comments should be consistent with other applicable programs/tools that address incompatible land use issues, to include: Readiness and Environmental Protection Integration (REPI) Program project proposals, AICUZ, RAICUZ, the Joint Land Use Study program, and identified Risk of Adverse Impact on Military Operations and Readiness Areas (RAIMORA). Incompatible land use may include but is not limited to: energy development and development resulting in noise complaints, safety issues, and visual interference.
- ▶ **Maritime**—Constraints placed on activities and ranges due to policy and regulatory requirements, and/or Military Service and agency guidance to protect and sustain the maritime environment, and to develop offshore resources. This includes offshore energy development, coastal and marine spatial planning, marine mammals, endangered species in the marine environment, fish habitats, coral reefs, coastal zones, sanctuaries, national monuments, and other marine protected areas.
- ▶ **Other Regulatory Requirements**—Constraints placed on activities and ranges due to legal and/or regulatory requirements and/or Military Service or agency guidance to manage:
 - **Wetlands**
Examples include: wetland areas that are off limits to specific training activities (e.g., heavy maneuver training, suitable landing zones for rotary aircraft), requirements to construct crossing sites that result in unrealistic training, requirements for mitigating wetland disturbance, wetland vegetation obstructing line of site.
 - **Cultural Resources**
Constraints on activities and ranges, or portions thereof, to manage cultural resources, including archaeological resources and historic properties. Examples can include: avoidance areas, limitations on target placement, limitations on ground disturbing activities, and reduced range access.
 - **Air Quality (including restrictions on prescribed burning)**
Examples include: training constraints to meet air emission standards (e.g., low-sulfur fuel required within 24 nautical miles of the mainland); including dust emissions from DoD training activities.
- **Water Quality/Supply**
Examples include: constraints on training due to ground and surface water discharge permit limitations, including existing and/or expansion of training activities; hazardous water conditions that create avoidance areas; insufficient potable water to accommodate personnel conducting training activities; and water supply limitations for fire suppression activities related to military training.
- **Munitions use, munitions constituents, or residue to include range clearance.** (Munitions use due to weapon safety footprint requirements extending beyond DoD controlled areas are not considered regulatory requirements. Other constraints from munitions use that have an Encroachment Factor available such as Noise and Transients will be assessed under those factors.)
Examples include: munitions type and quantity limitations reducing realistic training conditions (aerial bombing restrictions, other federal agency or foreign nation-controlled lands); avoidance areas due to presence of munitions on range.
- ▶ **Range Transients**—Constraints placed on activities and ranges due to the unannounced or unauthorized presence of individuals, livestock, aircraft, or watercraft transiting ranges.
- ▶ **Spectrum**—Constraints placed on activities and ranges due to unavailability of, or interference with, required electromagnetic spectrum.
- ▶ **Threatened & Endangered Species, Wildlife, and Habitat**—Constraints placed on activities and ranges due to regulatory requirements and/or Military Service or agency guidance to manage at-risk, candidate, threatened, or endangered species, associated habitat, and migratory birds. This factor could include those impacts due to species with the potential to be at risk in the future (including terrestrial and aquatic flora and fauna). Encroachment caused by flora and fauna in the marine environment will be assessed under maritime.

The Military Services assessed the impact from each of these factors on their range and range complexes' capabilities to support assigned training missions. The assessments were based on range availability and use using the following color rating scale:

- ▶ **Red**—The encroachment factor has a severe effect or poses a high risk to the range’s ability to support its assigned mission training and would likely cause the training mission to fail. Mitigating the encroachment would involve prohibitive costs or actions for the range.
 - ▶ **Yellow**—The encroachment factor has a moderate impact or poses a medium risk on the range’s ability to support its assigned mission training. Workarounds have a moderate impact on training content, procedure, or outcome. Addressing the encroachment results in additional burdens or requires additional actions by the range to mitigate the impact of the encroachment.
 - ▶ **Green**—The encroachment factor has minimal impact or poses a low risk on the range’s ability to support its assigned mission training. Workarounds detract minimally or not at all from training content, procedure, or outcome. Costs are not incurred by the range or range users to address the encroachment factor.
 - ▶ **White (Blank)**—White (blank) represents a situation where an encroachment factor does not exist for a given mission area.
- ▶ Historical Information, Results, and Future Projections provide a more qualitative assessment with several pieces of information. Overall rating scores from prior years are presented along with comments regarding whether the range complex’s capabilities or encroachment pressures have been improving or degrading over the years and the outlook for the future.
 - ▶ Detailed Comments for each range are grouped by capability observations and encroachment observations. These observations describe the red and yellow assessment ratings, explaining the problem or shortfall, the impacts to training activities, and any planned remedial actions.

3.2 ASSESSMENT RESULTS AND DISCUSSION

The following sections represent the result from each Military Service’s range assessments.

3.1.3 Explanation of Individual Range Assessment Details and Observations

The DoD assessed each Military Service’s individual ranges/ range complexes for its ability to support assigned training missions using the 13 common capability attributes and 9 common encroachment factors using the red, yellow, and green rating scales discussed above. The individual range assessments are organized by Military Service. An explanation for how to read and interpret these charts is discussed further below. Major elements of each presentation, in the order in which they appear, are as follows:

- ▶ Pie charts depicting the overall distribution of red, yellow, and green ratings are presented with calculated rating scores on a scale of 0 to 10. The overall rating scores for both capability and encroachment assessments are weighted average scores with 0 assigned for each red rating, 5 for each yellow rating, and 10 for each green rating.
- ▶ Summary Observations, located below the charts and scores, provide information on what encroachment factors and capability attributes having the most significant impact on each range’s ability to perform its assigned mission, along with those mission areas most severely impacted.

3.2.1 Army Range Assessments

Table 3-1 Army Capability Assessment Data Summary

Range	NMC	PMC	FMC	Capability Scores
Fort Benning	7	10	49	8.18
Fort Bliss	0	4	44	9.58
Fort Bragg/ Camp Mackall	0	22	31	7.92
Fort Campbell	0	5	37	9.40
Fort Carson & PCMS	0	11	35	8.80
Fort Drum	0	2	39	9.76
Hawaii	3	4	19	8.08
Fort Hood	0	2	59	9.84
Fort Irwin	0	11	40	8.92
Joint Base Lewis-McChord	0	12	38	8.80
Fort Polk	6	2	51	8.81
Fort Riley	0	2	56	9.83
Fort Stewart	6	6	32	7.95
Fort Wainwright	0	13	37	8.70
Yakima Training Center	6	2	47	8.73
HQ Army	28	108	614	8.91

Figure 3-1 Army Capability Chart and Scores

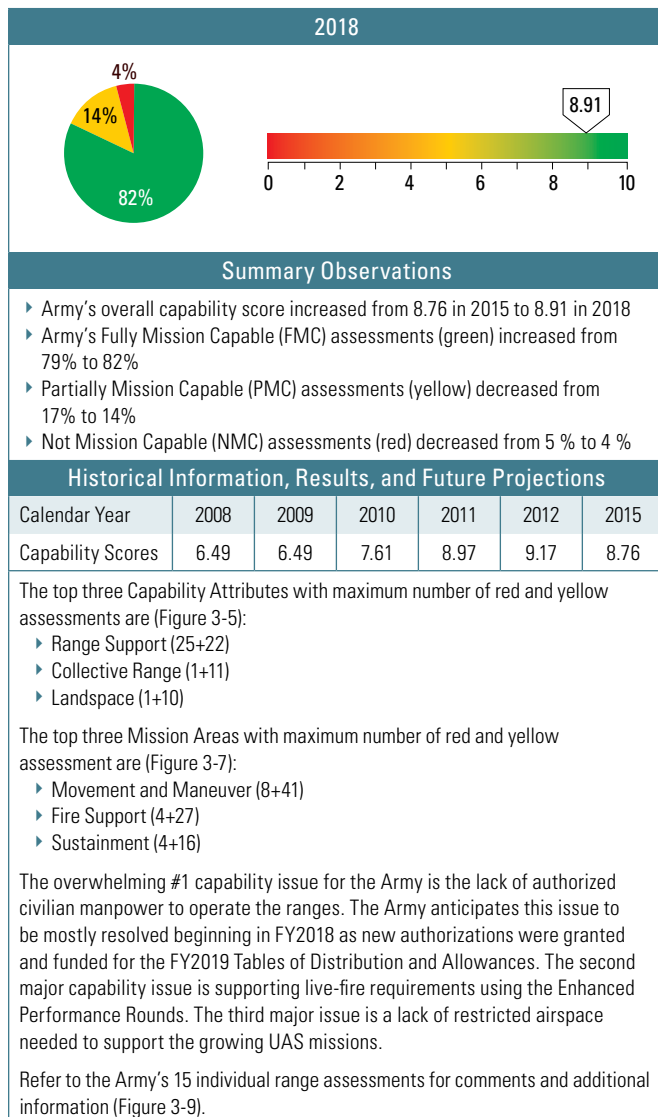


Table 3-2 Army Encroachment Assessment Data Summary

Range	Severe	Moderate	Minimal	Encroachment Scores
Fort Benning	1	7	40	9.06
Fort Bliss	0	9	31	8.88
Fort Bragg/ Camp Mackall	0	9	20	8.45
Fort Campbell	0	2	30	9.69
Fort Carson & PCMS	0	6	24	9.00
Fort Drum	0	0	16	10.00
Hawaii	6	3	14	6.74
Fort Hood	0	6	46	9.42
Fort Irwin	0	2	34	9.72
Joint Base Lewis-McChord	0	5	19	8.96
Fort Polk	1	1	40	9.64
Fort Riley	0	0	48	10.00
Fort Stewart	0	6	42	9.38
Fort Wainwright	0	13	29	8.45
Yakima Training Center	0	4	20	9.17
HQ Army	8	73	453	9.17

Figure 3-2 Army Encroachment Chart and Scores

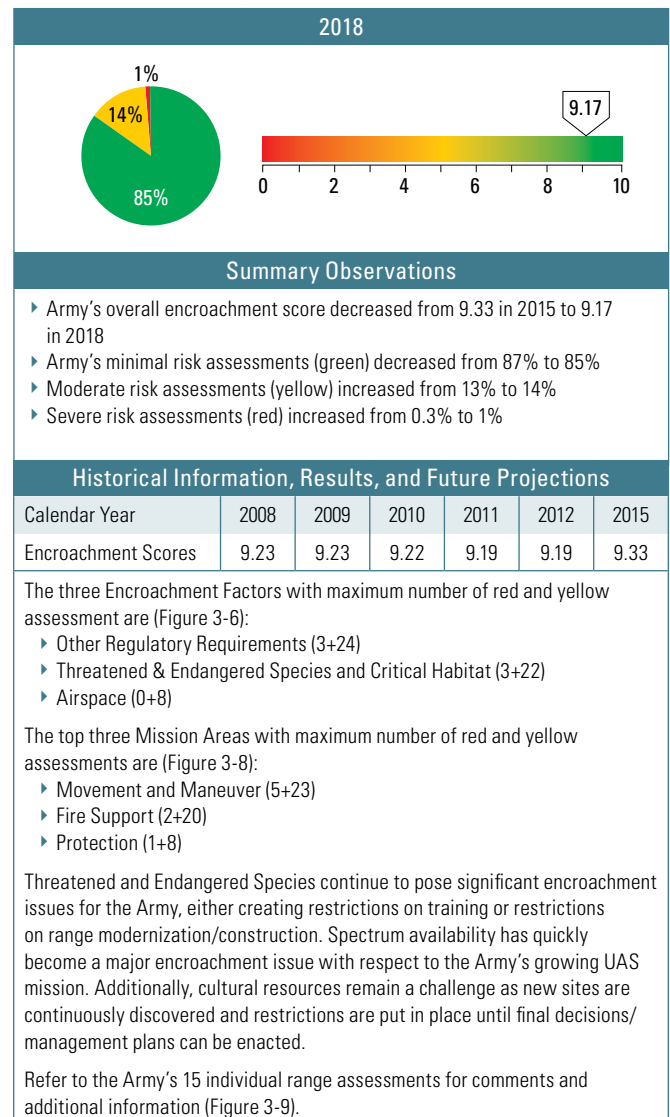
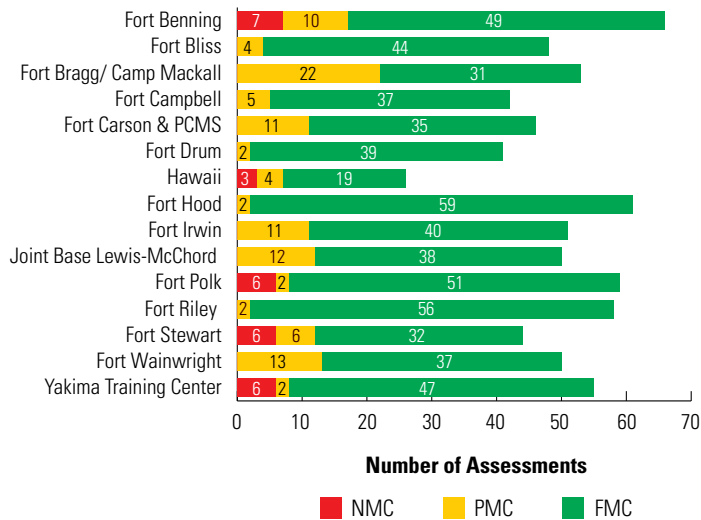
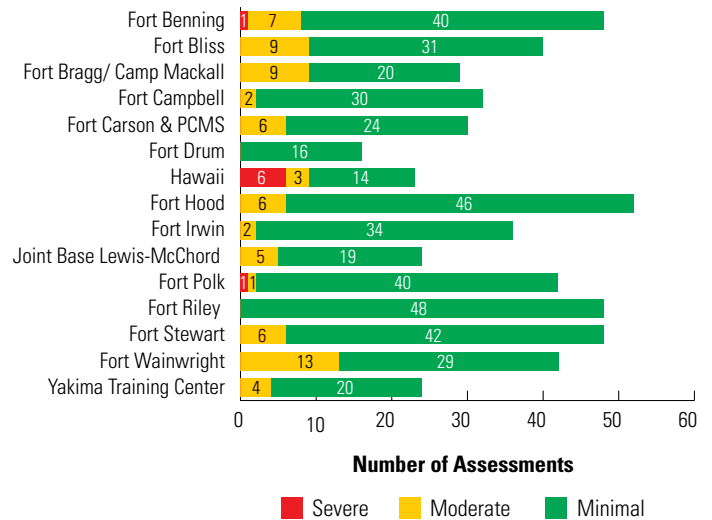
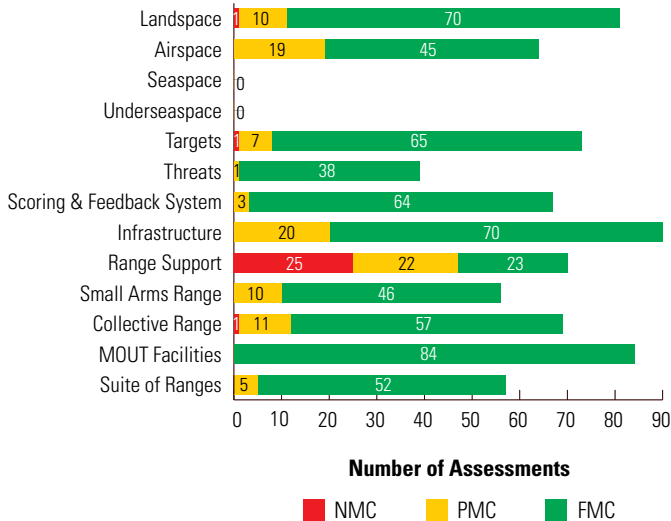
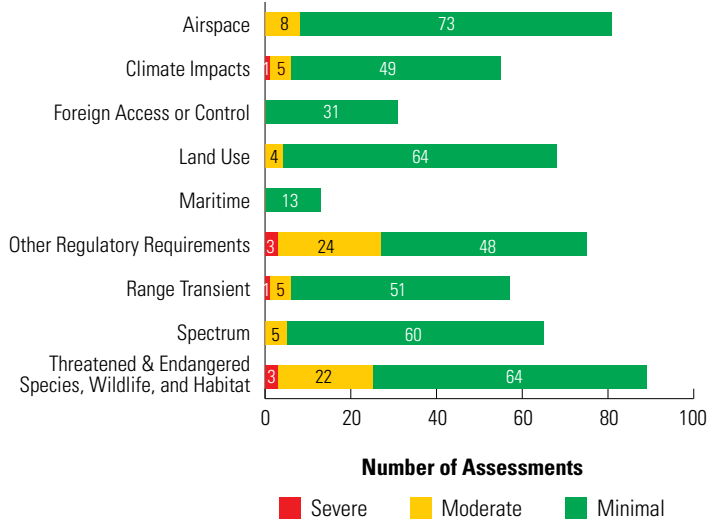
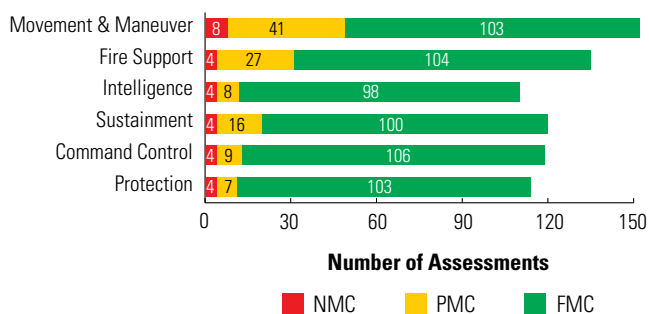
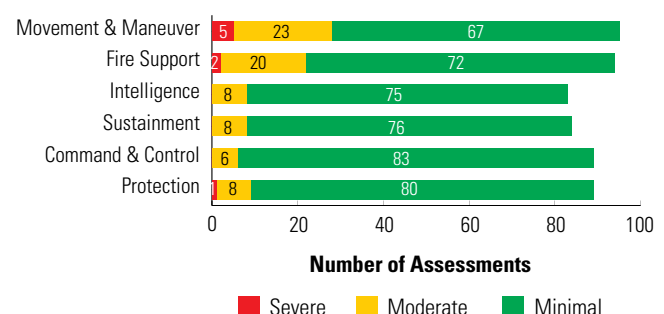
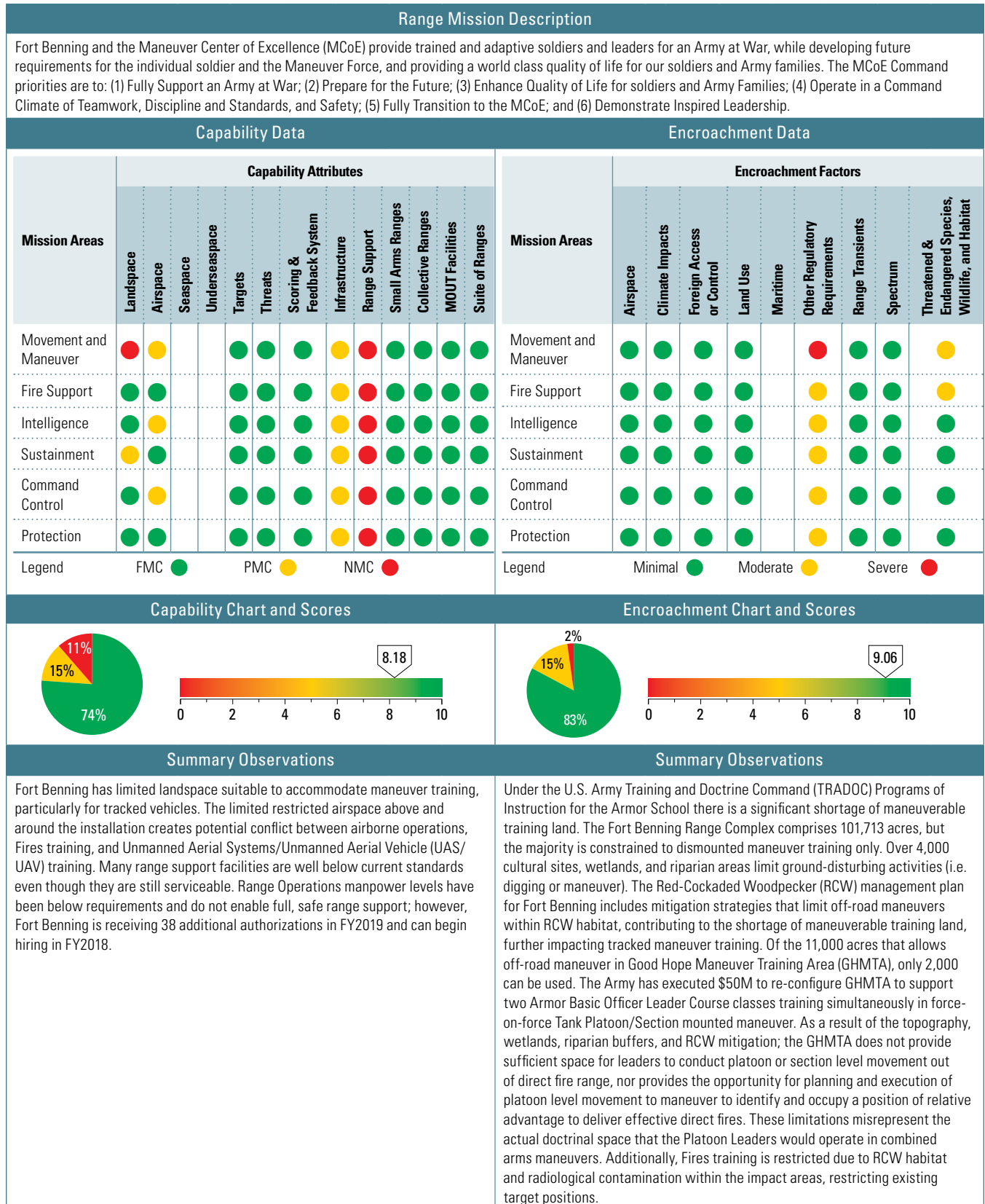


Figure 3-3 Army Capability Assessments by Range**Figure 3-4 Army Encroachment Assessments by Range****Figure 3-5 Army Capability Assessment by Attributes****Figure 3-6 Army Encroachment Assessment by Factors****Figure 3-7 Army Capability Assessment by Mission Areas****Figure 3-8 Army Encroachment Assessment by Mission Areas**

The number of Army ranges is 234 less than the number reported in FY2015. This reduction is mainly due to sites that have been historically closed yet were erroneously reported as still in the inventory, or non-Army owned sites that are still active but have not supported Army live-fire training in the past 5 years and are not anticipated to support Army live-fire training in the foreseeable future. Of the 274 ranges identified in the Army's range inventory in Appendix A, there are a total of 239 that are resourced and fall under the Army's Sustainable Range Program. These 239 ranges comprise three tiers that were established using mission value, to include unit stationing, institutional schools/other mission support, land asset size, and level of training (individual, crew, collective). Training sites that are not part of the 239 supported sites are typically small, individual training ranges managed through local Army National Guard (ARNG)/state agreements and policies. The Army only maintains inventory level data for these sites. Although the Army continually evaluates all ranges, only the 21 ranges that represent Tier I sites are included in assessments due to the impracticality of compiling the information for every range. There are seven active component ranges inventoried separately in Hawaii that are grouped together for the assessment because they represent a single training complex for management purposes. The Tier I installations represent approximately 88 percent of the training load on Army active duty ranges.

Figure 3-9 Army Capability and Encroachment Assessment Detail

Fort Benning Assessment Details



Fort Benning Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	6.33	6.33	7.56	8.41	9.39	7.00	Encroachment Scores	8.25	8.25	8.72	8.72	8.81	6.67
Fort Benning has executed several projects to open up the GHMTA for tracked maneuver; however, the area does not fully allow for force-on-force training for the Armor School. Fort Benning is looking at other locations on the installation that can be reconfigured to better accommodate this type of training. Fort Benning's Range Operations support has been undermanned since the movement of the Armor School which generated 23 new ranges but didn't include personnel to operate and maintain those ranges and targets. FY2015 Table of Distribution and Allowances (TDA) cuts further impacted Fort Benning's ability to fully support the ranges. The additional authorizations in FY2019 will vastly improve Fort Benning's range support capabilities.							Fort Benning continues to use the Army Compatible Use Buffer (ACUB) program to mitigate encroachment impacts. Approximately 27,000 acres have been protected along the eastern and northeastern boundary lines. These lands serve to protect training from future development and are planned for use as RCW habitat to lessen the restrictions on post. Fort Benning is transitioning the strategy into an Army-led, Formal Section 7 consultation with the U.S. Fish and Wildlife Service (USFWS) to provide the regulatory certainty necessary for ensuring ACUB investments at Fort Benning provide relief from training restrictions and/or land use constraints.						

Fort Benning Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landscape	Movement and Maneuver	●	Fort Benning does not have adequate maneuverable training land at GHMTA to satisfy Armor School and assigned unit requirements. Maneuver training is not accomplished to standard, and gaining units are required to shoulder the burden of fully training their Armor Soldiers to basic standards. Assigned units must perform training at other locations. Fort Benning is reviewing possible alternatives to GHMTA for reconfiguration.
	Sustainment	●	Same as above.
Airspace	Movement and Maneuver	●	Extensive US Air Force (USAF) flight activity in support of parachute operations, primarily for the Airborne School occurs approximately four miles South-Southeast of the airfield. This training is normally executed using the USAF C-130 or C-17 aircraft. The airfield is also used as a staging or target base for airfield seizure exercises. Additionally, UAS/UAV use is increasing as units have begun utilizing these assets more frequently. Any interruption to these activities due to an accident would cause an unacceptable backlog of students. Fort Benning is building "Air Boxes" to define the space for manned, unmanned, and live-fire use, to include clearance with other missions. Fort Benning is in close coordination the Federal Aviation Administration (FAA) and will continue to monitor operations in planning and execution.
	Intelligence	●	Same as above.
	Command Control	●	Same as above.
Infrastructure	Movement and Maneuver	●	The support facilities on 56 of 81 active ranges were constructed prior to 1960 and, although serviceable, no longer meet U.S. Army Corps of Engineers (USACE) standards. This negatively impacts the first impressions of Initial Entry Soldiers and Officers in the most powerful Army in the world. These facilities will be replaced as funds become available, but there is currently anticipated completion date.
	Fire Support	●	Same as above.
	Intelligence	●	Same as above.
	Sustainment	●	Same as above.
	Command Control	●	Same as above.
	Protection	●	Same as above.
Range Support	Movement and Maneuver	●	In the Base Realignment and Closure (BRAC) process Fort Benning gained 23 ranges with no increase in Range Operations manpower. The FY2015 TDA further reduced Range Operations manpower by 21. Range maintenance is understaffed which causes deferred maintenance and closure of some firing lanes and increases time required to accomplish training task on those ranges affected. Additionally, Safety Patrols are also understaffed which limits inspections to High Risk events. Fort Benning has received 38 additional authorizations in FY2019 which can begin to be hired against in FY2018. This will fix the Range Operations shortfall constraint.
	Fire Support	●	Same as above.
	Intelligence	●	Same as above.
	Sustainment	●	Same as above.
	Command Control	●	Same as above.
	Protection	●	Same as above.

Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

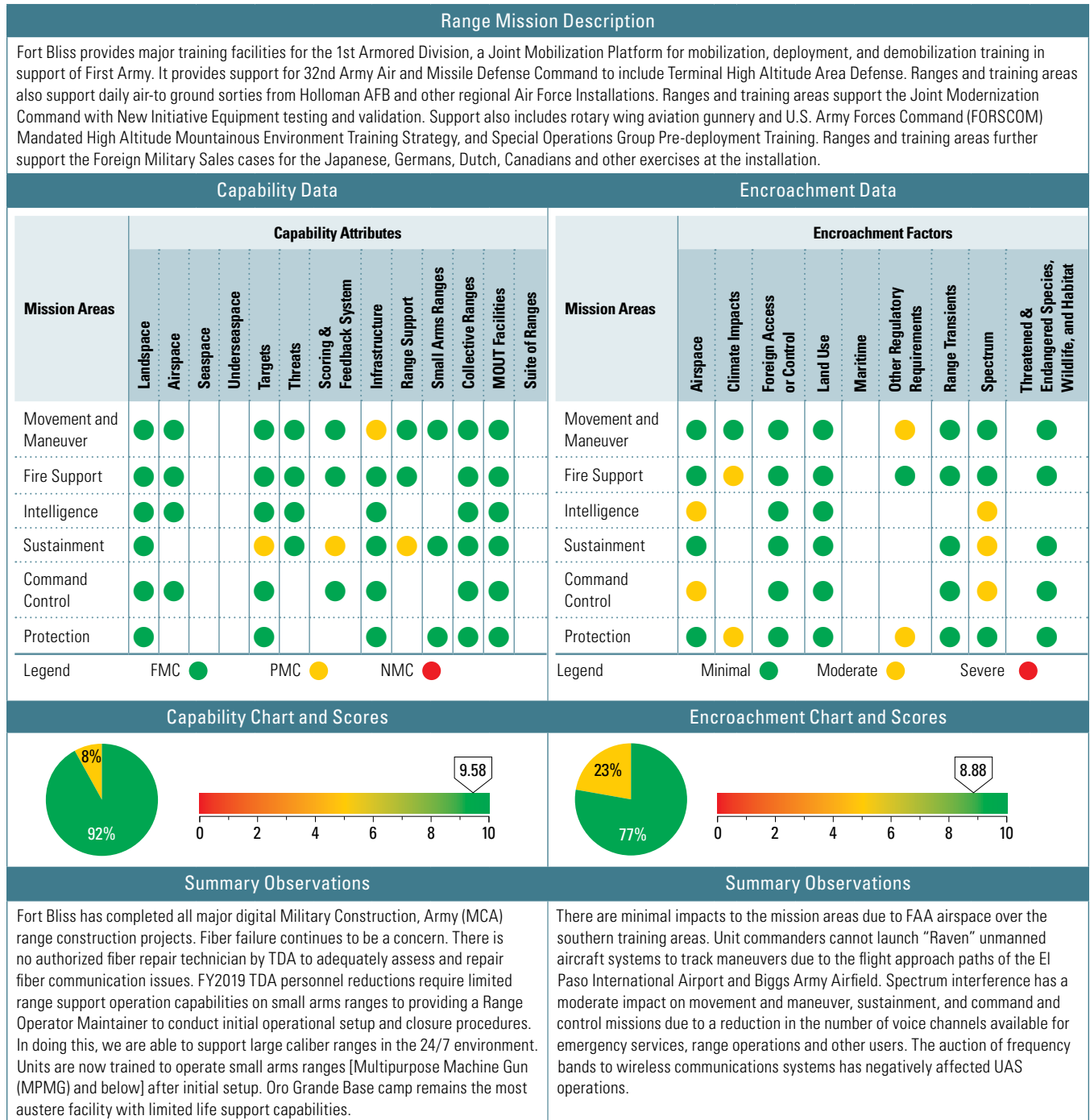
Fort Benning Detailed Comments

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Other Regulatory Requirements	Movement and Maneuver	●	Training across Fort Benning is affected due to the presence of almost 4,000 cultural sites on post. This results in approximately 4,000 acres of maneuverable training land that is off-limits to ground-disturbing activities. Integrated planning and management at the installation helps to balance mission training requirements with compliance laws, restrictions, and regulations. Mitigation through excavation typically enables the off-limits acreage to be returned to a restriction-free status.
	Fire Support	●	Same as above.
	Intelligence	●	Same as above.
	Sustainment	●	Same as above.
	Command Control	●	Same as above.
	Protection	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Movement and Maneuver	●	The RCW management plan for Fort Benning includes mitigation strategies that limit off-road maneuvers within RCW habitat, contributing to the shortage of maneuverable training land, further impacting tracked maneuver training. Of the 11,000 acres that allows off-road maneuver in GHMTA, only 2,000 can be used. Fort Benning is in the process of identifying other areas on post that might be able to accommodate the training footprint requirements for the Armor School.
	Fire Support	●	Fires training is restricted due to RCW habitat and radiological contamination within the impact areas, restricting existing target positions. This has resulted in some target positions being disabled and reduces the variability and complexity of Fires training scenarios. Earthen berms are used to mitigate most of the impact, but not all habitat areas can be protected this way. Fort Benning is in the process of identifying other areas on post that might be able to accommodate the training footprint requirements for the Armor School.

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Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

Fort Bliss Assessment Details



Fort Bliss Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	4.78	4.78	7.33	9.17	9.40	9.69	Encroachment Scores	10.00	10.00	9.02	9.63	9.63	9.24
Fort Bliss has some current capabilities and throughput shortfalls due to continuous and ongoing construction and upgrades that closed down several ranges periodically. These impacts are continually being addressed and mitigated. Range support has improved with increase in manpower over the last several months enabling increased support to ongoing missions; however without the support of the current personnel range support contracts, manpower would not be sufficient to cover and maintain all the ranges on Fort Bliss.							Encroachment factors have not historically impacted the mission at Fort Bliss. Moderate impacts resulting from FAA airspace, spectrum interference, and cultural resources have developed over time. These impacts are being managed and mitigated at the installation level and are improving annually.						

Fort Bliss Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Targets	Sustainment	●	Digital ranges are operated through digital fiber source. Target failure due to fiber breaks occur and Range Branch does not have TDA authorization for Fiber repair personnel. These breaks result in loss of communications for an entire chain of targets reducing the range capabilities for units training. Range Branch has lost one MPMG due to fiber failure and had to reconfigure the range to operate under RF capabilities. Currently we have several ranges with reduced capabilities due to fiber issues. Range Branch received UFR approval for one fiber repair man pending available funding for this FY. Range will resubmit an Unfinanced Requirement (UFR) request for FY2018.
Scoring & Feedback System	Sustainment	●	Range 50 is our "Legacy" Multiple Purpose Range Complex (MPRC) (Heavy) with limited feedback capability. Units had to train Crew Evaluators on timing procedures for their After Action Review (AAR). Video cassettes were the source of visual feedback and are no longer on the market. This affected units ability to receive a first calls debrief on qualification tables. Range Branch received approval for \$500K Tracer Suite to upgrade feedback capabilities for FY2018. Range will coordinate range closure when funding becomes available for upgrade.
Infrastructure	Movement and Maneuver	●	Oro Grande Base Camp lacks sufficient facilities to accommodate unit training densities (Billets, feeding areas, Fire or Emergency Aid Stations). Base Camp does not have a motor pool capable of accommodating heavy tracked vehicles. There is no track vehicle crossing areas for easy access to major ranges, units must travel several miles away from the camp to cross over Highway 54 to the Oro Grande range complex.
Range Support	Sustainment	●	The current OPTEMPO for units training is increasing due to mobilization and demobilization and annual Army training events. Mission support requirements increased based off deconfliction of ranges and weekend support. Contractor support on major large caliber ranges has reduced some support overall, but continue to function well. Personnel reductions for FY2019 TDA will limit support capabilities for all ranges. Range Branch has implemented a training program for the small arms ranges, training Soldiers to operate after range personnel has initiated initial setup/power operations and placed some non-Army Range Requirements Model (ARRM) training venues in a dormant status.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Range Transients	Intelligence	●	Unit commanders cannot train with their internal "Raven" Unmanned Aircraft Systems in FAA airspace over the Southern Training Area 1 and 2 series. The majority of this area is covered by Bliss Army Airfield and El Paso International Airport approach paths. This affects intelligence gathering training and the ability to effectively exercise full command and control decision making process in the lower echelon command structures. This training is available north in our vast Special Use Airspace (SUA) and is only a minor limitation to units training at Fort Bliss. No immediate mitigation required.
	Command Control	●	Same as above.
Climate Impacts	Fire Support	●	Units are restricted from training with fire producing munitions during "Red Flag" weather conditions due to high winds and severe drought conditions (February through May). These conditions are forecasted by the National Weather Service for New Mexico. Red Flag conditions are minimal and limited in time and duration causing a moderate impact to unit training. All live fire ranges are physically located in New Mexico. Other fire condition statuses (Amber through Red FIRECON) are regulated in accordance with Fort Bliss Regulation 385-63 for waiver approval authority level. Units are required to provide supporting Concepts of Operations and Risk Assessments mitigating the possibility of uncontrolled wildfires. Directorate of Public Works (DPW) Environmental Branch has developed numerous firebreaks to reduce wild fires and continues to assess annually.
	Protection	●	Same as above.

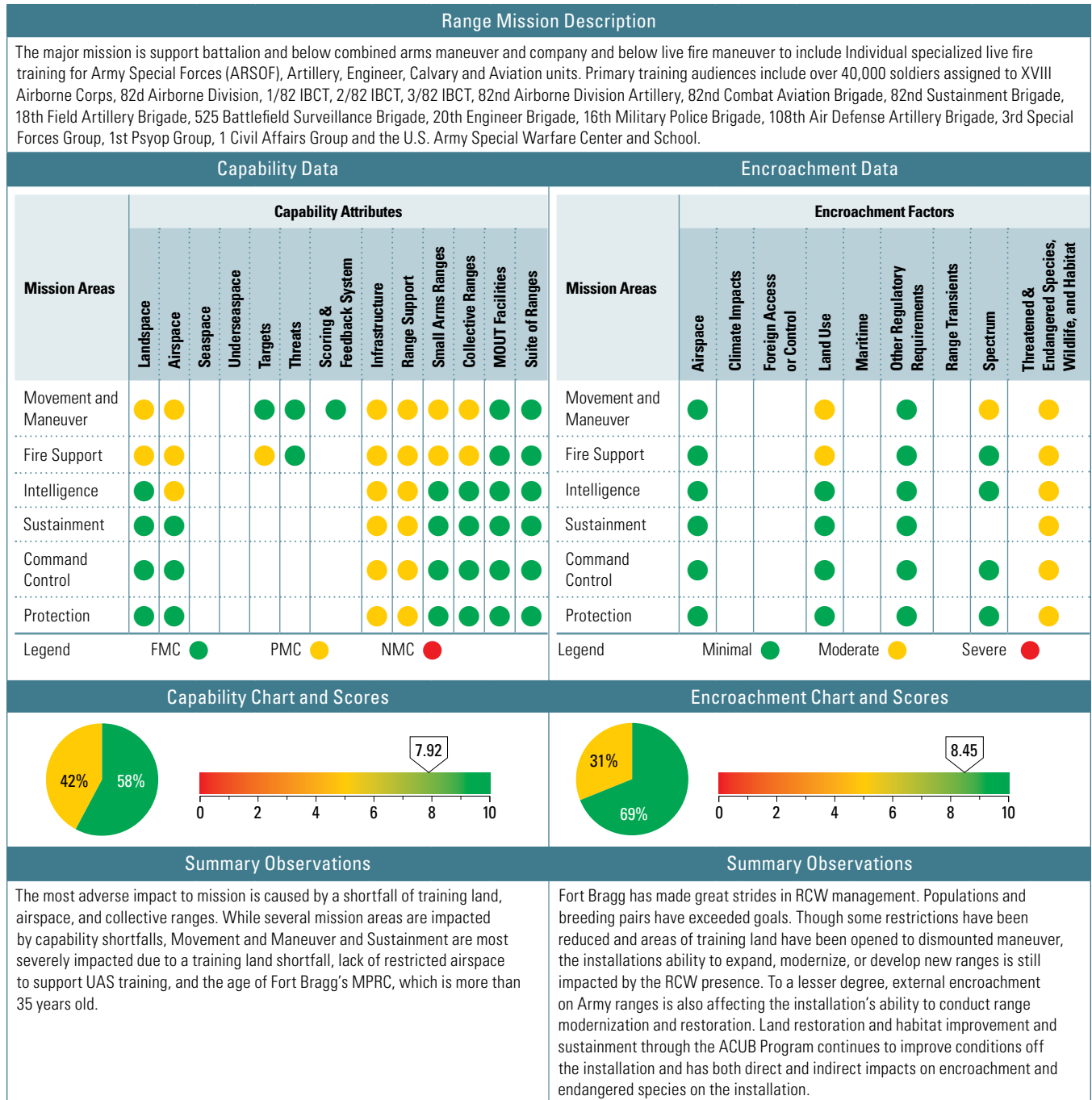
Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)**Fort Bliss Detailed Comments**

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Other Regulatory Requirements	Movement and Maneuver	●	Archaeological/cultural areas reduce doctrinal maneuver operations for establishing Tactical Assembly Areas; dust emissions limit speed adjacent to major state highways; unexploded ordnance restrict dismounted and mounted maneuvers on specific live fire ranges. Training units have to adjust plans in order to protect lands, reduce speed adjacent to major highways, and follow cleared lanes on specific ranges. DPW Environmental Branch works annually mitigating archaeological/cultural sites through Environmental Impact Studies, correlation with the National Historic Preservation Agencies and conducting Record of Environmental Consideration actions in accordance with National Environmental Policy Act (NEPA). The Fort Bliss Provost Marshall has set regulatory speed limits for movement adjacent to major highways to reduce the dust affecting civilian traffic. Range Operations is working with local Explosive Ordnance Disposal (EOD) unit to mitigate the unexploded ordnance on range footprints to allow dismounted maneuver.
	Protection	●	Same as above.
Spectrum	Intelligence	●	The currently allocated spectrum is approximately 70% of the future operationally required spectrum. Additionally, the frequency spectrum must be shared with Mexico. Interference from Mexico on the Ultra-High Frequency (UHF) band sometimes interferes with the trunked land mobile radio (LMR) system at Fort Bliss, which reduces the number of voice channels available for emergency services, range operations and other users. Recently Spectrum has auctioned off frequency bands to wireless network companies negatively affecting UAS operations. The mitigation strategy is to share frequencies and deconflict available spectrum. The DoD Area Frequency Coordinator (AFC) is working to issue single Radio Frequency Authorizations (RFA's) that include frequency assignments for operations at Bliss, WSMR, and/or Holloman. All frequencies will be scheduled and deconflicted in the Integrated Frequency Deconfliction System database. Spectrum Managers at each installation will submit requests for new permanent frequency assignments as required.
	Sustainment	●	Same as above.
	Command Control	●	Same as above.

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Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

Fort Bragg Assessment Details



Fort Bragg Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	5.33	5.33	8.00	8.84	9.07	7.92	Encroachment Scores	10.00	10.00	9.17	9.39	9.39	8.92
Capability has improved at Fort Bragg over the past several years. Impacts resulting from the shortfall of training land have become more significant and can no longer be fully mitigated by the installation. Additionally, as more UAS are fielded the installation's ability to fully support all aviation training is reduced unless more restricted airspace is designated. It is anticipated that additional UAS fielding will continue to be a challenge for the installation into the future.							Environmental considerations and oversight activities continue to influence management and new construction of ranges as well as the restoration and improvement of training lands. Encroachment due to Threatened and Endangered Species (TES) and associated habitat protection, has been well managed within the installation to accommodate training; however, it still has not alleviated training impacts. Environmental considerations and oversight activities influence management and new construction, restoration, or improvement of ranges and training lands.						

Fort Bragg Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Movement and Maneuver	●	There is a 100,000 acre shortfall of training land. The result is units do not have adequate room to separate and extended their organizations. The solution has been to train on other locations.
	Fire Support	●	Same as above.
Airspace	Movement and Maneuver	●	There is not enough airspace for units to employ all their UAS assets and utilize tactical air at the same time. The result is units are not receiving training on UAS systems and are required to train on other locations.
	Fire Support	●	Same as above.
	Sustainment	●	Same as above.
Targets	Fire Support	●	There are not enough hard targets for artillery units inside the impact areas. As a result, units cannot train on the specific tasks of targeting large or irregular shaped targets. The solution has been to train at other locations.
Infrastructure	Movement and Maneuver	●	Bridges in the training areas are unsafe and no longer support the training units. As a result, units do not have adequate road/bridge networks to drive any substantial distances with heavier vehicles. The solution has been to train at off post locations.
	Fire Support	●	Same as above.
	Intelligence	●	Same as above.
	Sustainment	●	Same as above.
	Command Control	●	Same as above.
	Protection	●	Same as above.
Range Support	Movement and Maneuver	●	Range control does not have sufficient support personnel in key areas such as maintenance, operations and headquarters areas. This installation was designated as a major training installation for forces along the east coast, which increases an already heavy load of training personnel previously stationed here. Fort Bragg has been authorized 21 additional positions for FY2019 and can start hiring against those positions in FY2018.
	Fire Support	●	Same as above.
	Intelligence	●	Same as above.
	Sustainment	●	Same as above.
	Command Control	●	Same as above.
	Protection	●	Same as above.
Small Arms Ranges	Movement and Maneuver	●	There are insufficient long-range shooting areas for the newer weapon systems with longer effective ranges. As a result, units are not receiving training on the full capabilities of newer weapon systems. The solution has been to train at off post locations.
	Fire Support	●	Same as above.
Collective Ranges	Movement and Maneuver	●	TC 25-8 standard collective ranges such as MPRC, Infantry Platoon Battle Course (IPBC) and Infantry Squad Battle Course (ISBC) are not available on this installation. As a result, units are not receiving the best possible collective training on their mission essential tasks. The solution has been to train at off post locations or use non-standard facilities.
	Fire Support	●	Same as above.

Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

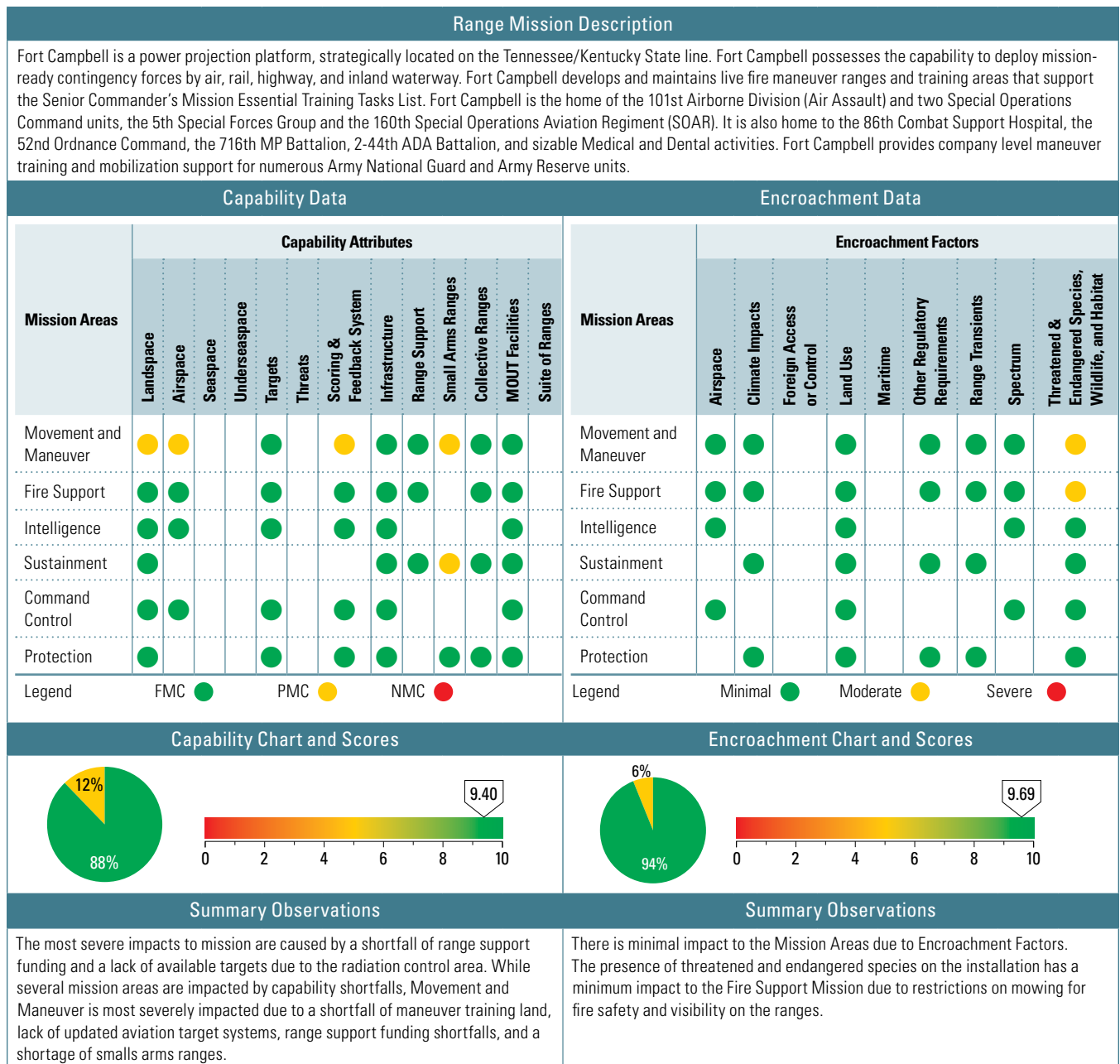
Fort Bragg Detailed Comments

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Land Use	Movement and Maneuver	●	Encroachment is increasing. ACUB helps with separation, but is limited. External encroachment forces training to be conducted closer to the center of the training complex, thereby limiting training options.
	Fire Support	●	Same as above.
Spectrum	Movement and Maneuver	●	The number of UAS that can fly simultaneously is limited due to insufficient available spectrum and an increased volume of UAS. The available spectrum bandwidth is not large enough to adequately train Gray Eagle platforms.
Threatened & Endangered Species, Wildlife, and Habitat	Movement and Maneuver	●	RCW population increase has resulted in unanticipated TES encroachment due to associated habitat protection. A significant consequence is the limited ability to construct or reconfigure a ranges (MPRC, IPBC and ISBC) to meet training and readiness requirements. The installation's solution has been to train at other suitable locations.
	Fire Support	●	Same as above.
	Intelligence	●	Same as above.
	Sustainment	●	Same as above.
	Command Control	●	Same as above.
	Protection	●	Same as above.

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Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

Fort Campbell Assessment Details



Fort Campbell Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	5.22	5.22	7.00	9.05	9.05	8.93	Encroachment Scores	10.00	10.00	10.00	9.88	9.88	9.88
Capabilities have generally improved at Fort Campbell over the past several years. Range support funding levels have increased and Fort Campbell has internally mitigated Military Operations in Urban Terrain (MOUT) facility throughput shortfalls. Shoot-house construction currently meets training needs, but if lead-free slug (LFS) fielding takes place to support home station training, there will likely be an impact to the installation's capability to meet requirements for MOUT facility throughput due to concerns about use of the LFS in sand filled shoot-houses. Lack of restricted airspace continues to be a concern and will limit the installation's ability to replicate the operational environment for Warrior UAS training.							Encroachment Factors have not historically impacted the mission at Fort Campbell. Minimal impacts resulting from rare species habitat on the installation have developed over the past year, but are being managed successfully through coordination with the USFWS. Current impacts are starting to emerge with woody encroachment beginning to spread into open fields due to the lack of current Integrated Training Area Management (ITAM) support contract. This contract provides the Land Rehabilitation and Maintenance Support (LRAM) heavy and light equipment operators that run the equipment (tractors, bush hogs, mulchers, etc.) that keep the woody encroachment at bay. Army Installation Management Command (IMCOM) is working towards a contract vehicle to resolve the issue and future impacts are not anticipated if resolved within this next fiscal year. Fort Campbell has also worked to actively implement the ACUB Program to ensure encroachment does not impact the future mission of the installation. Current ACUB efforts are focused on protecting the flight approach of the installation's primary operational airfield, Campbell Army Airfield, and buffering the small arms impact area to ensure long-term capability to support the training mission.						

Fort Campbell Detailed Comments

Capability Observations

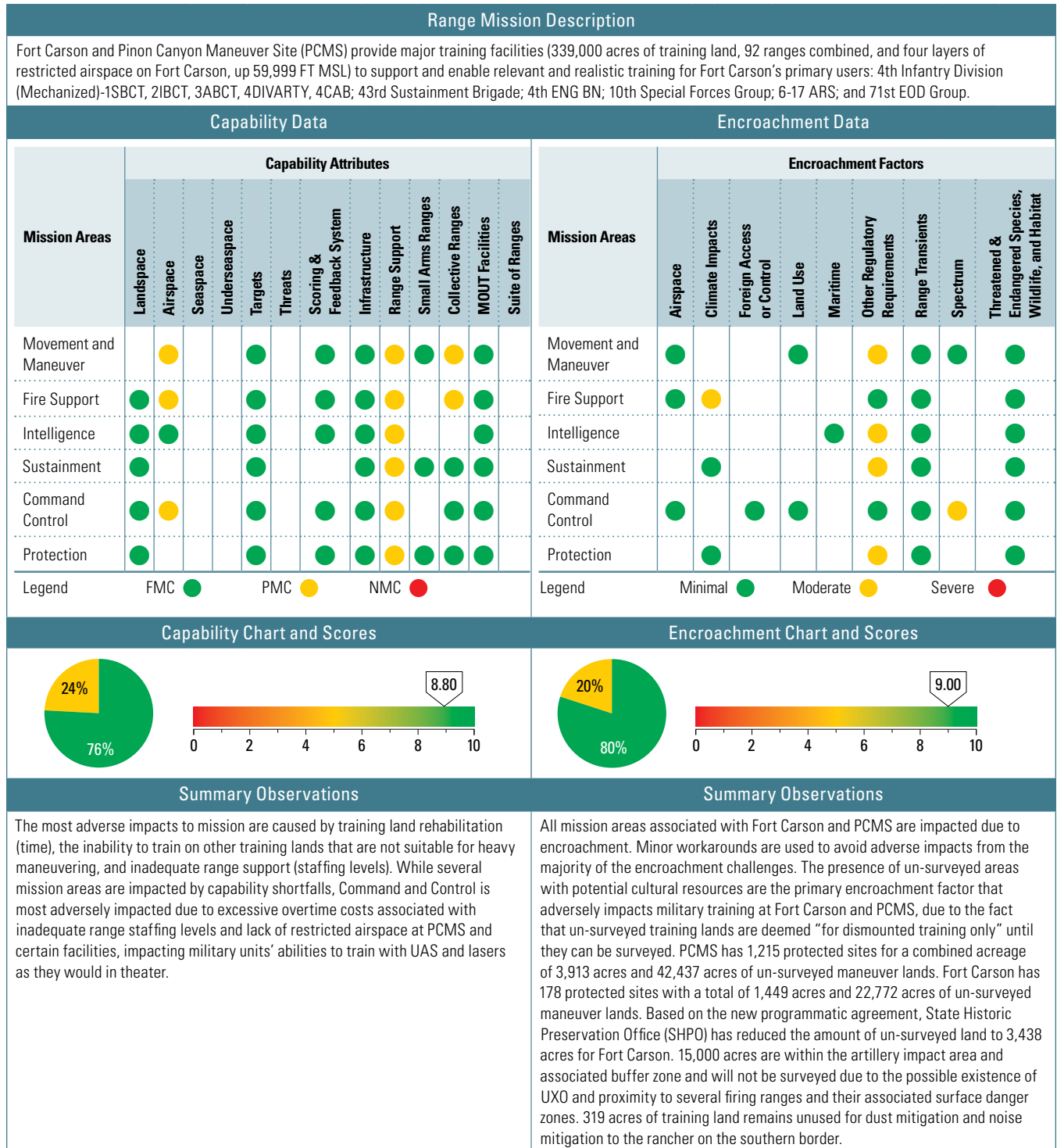
Attributes	Assigned Training Mission	Score	Comments
Landspace	Movement and Maneuver	●	There is a shortfall of available maneuver training land to meet doctrinal maneuver training requirements. Unit maneuver training is limited and movement is constrained to short one to three kilometer movements, depending on which training area the unit is assigned. Simultaneous maneuvering for multiple company sized units at doctrinal distances is constrained. OPTEMPO costs are increased for units that travel to other locations to accomplish training events. Fort Campbell is partnering with Fort Knox for training allocation of their maneuver land and ranges.
Airspace	Movement and Maneuver	●	There is limited controlled airspace over the installation. Limited airspace restricts the ability of units to conduct air training exercises to doctrinal standards in terms of dispersion, flight techniques, and integration with other assets, such as UAS. Fort Campbell is partnering with Fort Knox and other training sites to meeting training needs.
Scoring & Feedback System	Movement and Maneuver	●	The installation does not have an assigned Aviation Weapon Scoring System (AWSS) to support the two Combat Aviation Brigades and the Task Force 160, SOAR. Weapons qualification is dependent on subjective scoring (i.e. line of sight) that does not meet Army standards for qualification. Aviation units do not get consistently accurate feedback when qualifying. The Army has scheduled a rotating AWSS for temporary use at the installation.
Small Arms Ranges	Movement and Maneuver	●	The installation continues to have a deficit of two machine gun ranges and three live fire maneuver ranges. Unit training time is reduced and OPTEMPO costs are increased for units that have to travel to other locations to accomplish training events. MCA funding is programmed in FY2019 to construct additional ranges.
	Sustainment	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Threatened & Endangered Species, Wildlife, and Habitat	Movement and Maneuver	●	The Henslow and Bachman's Sparrow nesting habitat is present in the training area. During May-August, training land management actions (i.e. mowing, vegetation removal) are restricted and training use is reduced due to safety concerns (i.e. fire hazards, visibility). Three federally listed bat species are present on Fort Campbell: the Indiana bat, gray bat and, northern long-eared bat. Protection of foraging and roosting bat habitat is accomplished with seasonal management restrictions to ensure installation actions do not directly or indirectly adversely affect either species (i.e. tree removal supporting non-military readiness activities is restricted from 15 March to 15 November). Fort Campbell maintains an Endangered Species Management Component and continues close coordination with regional FWS to minimize restrictions and address training impacts.
	Fire Support	●	Same as above.

Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

Fort Carson Assessment Details



Fort Carson Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	6.67	6.67	7.22	9.29	9.29	9.50	Encroachment Scores	9.24	9.24	10.00	9.71	9.71	9.80
Capabilities have generally improved at Fort Carson and PCMS over the past several years. The use of military construction projects and self help assets have postured the installation at an adequate readiness level to support the training throughput requirements of current stationing levels. It is anticipated that the most critical capability shortfall, Range Support (personnel) will improve in the near term due to recent increases in manpower authorizations starting in FY2019. The ability to obtain restricted airspace over PCMS will be a challenge, and it is anticipated that this lack of restricted airspace will cause future capability shortfalls as additional UAS and rotary wing aircraft are fielded in the out years.							Encroachment has not historically had a significant impact on the mission at Fort Carson and PCMS. Fort Carson is re-evaluating procedures for planning/ implementing training events to ensure all regulatory requirements, including protection of cultural resources, are being met. The use of best management practices in sustaining the training lands has also contributed to additional lands being added back into the training inventory. Additionally, Fort Carson has been able to prevent encroachment impacts from adjacent land use, due to implementation of the ACUB Program. Communities near Fort Carson are rapidly developing and it is vital that the ACUB Program continue to be funded to prevent incompatible development around the installation that would negatively impact the training mission.						

Fort Carson Detailed Comments

Capability Observations


Attributes	Assigned Training Mission	Score	Comments
Airspace	Movement and Maneuver	●	PCMS currently has no restricted airspace and cannot support UAS training above Raven at 1500ft AGL, lasers, nor 20mm mortar firing. Units cannot use other UAS assets and, therefore, cannot train as they fight. The installation is executing the necessary steps and procedures to seek and obtain restricted airspace. Meanwhile, units must execute UAS training at Fort Carson and simulate UAS operations at PCMS.
	Fire Support	●	Same as above.
	Command Control	●	Same as above.
Range Support	Movement and Maneuver	●	Current on board manpower strength is 39 percent. This has driven excessive overtime requirements to sustain prolonged training and sufficiently enable support of mission requirements. Fort Carson has been authorized 63 additional positions for FY2019 and can start hiring against those positions in FY2018.
	Fire Support	●	Same as above.
	Intelligence	●	Same as above.
	Sustainment	●	Same as above.
	Command Control	●	Same as above.
	Protection	●	Same as above.
Collective Ranges	Movement and Maneuver	●	Recent stationing of a Stryker Brigade has caused a shortfall in collective training facilities and mortar firing points. According to the ARRM we have a shortfall of three ISBC, three IPBC and 10 mortar firing points. An additional IPBC is currently in the 95 percent design review phase. Shortfalls in DAGIR and Battle Area Complex (BAX) requirements hinder throughput capabilities.
	Fire Support	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Climate Impacts	Fire Support	●	Recent high winds have resulted in target damage on multiple ranges. Ranges affected by the wind required extended downtime for repairs resulting in loss of training time. Targets will be tied down and ranges put in cease fire until storms pass to mitigate against future wind event damage.
Other Regulatory Requirements	Movement and Maneuver	●	The presence of un-surveyed areas with potential cultural resources adversely impacts military training at Fort Carson and PCMS. Un-surveyed training lands are deemed "for dismounted training only" until they can be surveyed. Fort Carson is working with the SHPO to refine lands required for survey.
	Intelligence	●	Same as above.
	Sustainment	●	Same as above.
	Protection	●	Same as above.

Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

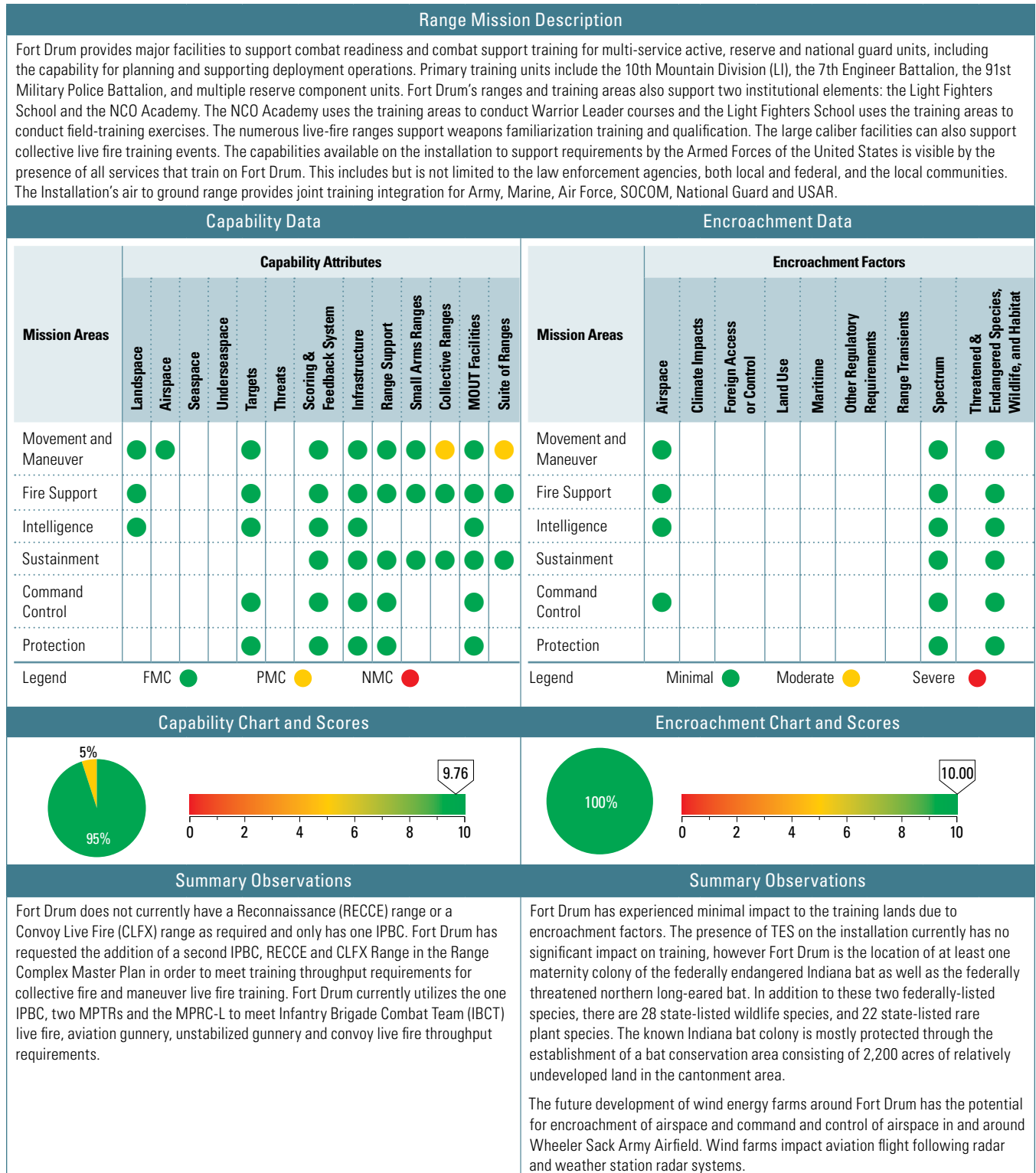
Fort Carson Detailed Comments

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Spectrum	Command Control		Spectrum bands are being reduced by competing civilian requirements resulting in a limited amount of unmanned aircraft that can fly in designated areas due to frequency limitations. Efforts are being made to use technology that allows multiple frequencies in a certain bandwidth, but frequencies on ranges in the same bandwidth result in competition challenges.

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Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

Fort Drum Assessment Details



Fort Drum Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	5.11	5.11	8.15	9.19	9.19	9.63	Encroachment Scores	9.10	9.10	10.00	10.00	10.00	10.00
<p>Capabilities have generally improved at Fort Drum over the past several years. Range support funding has allowed Fort Drum to conduct target replacement and increases in manpower authorizations with ensure the ability to serve using units in a timely manner. Fort Drum training areas and ranges currently have capacity, when funded to requirements, to support Sustainable Readiness Model (SRM) individual and collective live, virtual, constructive and gaming training requirements for the 10th Mountain Division and assigned Brigade Combat Teams/Brigade Headquarters, along with tenant units and aligned units.</p>							<p>Historically, Fort Drum's training capabilities have not been impeded or degraded by encroachment. Fort Drum has aggressively eliminated or mitigated noise-related and adjacent land-development impacts through community outreach efforts and the ACUB program. While the current overall threat of encroachment impacts to Fort Drum's training capabilities is extremely low, potential of future encroachment remains a consideration due to the possibility of emerging missions as well as planned development along the northwestern borders of the installation that have the potential to push existing natural habitats onto the installation.</p> <p>To date, 20 conservation easements protecting nearly 4,700 acres bordering the installation have been protected through the ACUB program. Three parcels targeted for ACUB easements in FY2014 will buffer Fort Drum's aviation accident potential zones. Development in areas critical to flight missions and flight training have the potential to impact or limit some flight operations. Approach and departure routes as well as traffic patterns need to remain protected from incompatible development. Some potential encroachment issues may come from residential and commercial development. A robust mitigation strategy to maintain a safe and comprehensive aviation airspace in support of the Fort Drum mission is a key and essential component to our future. In addition, Fort Drum supports extensive UAS missions making protection of airspace and land training areas critical. Fort Drum's five-year ACUB project plan focuses on areas south of the installation in order to protect accident potential zones as well as establish a buffer to protect potential future defense assets. The installation will continue to forward plan into the out years to mitigate encroachment issues.</p> <p>Fort Drum has undertaken several other coordinated planning efforts to address encroachment threats. For example, Fort Drum maintains an excellent relationship with the community and the Fort Drum Regional Liaison Organization (FDRLO). Established in 1990 as a community-based membership organization, the FDRLO has the mission of preserving positive inter-relationships and communication between the civilian and military communities and leaders in the tri-county region of Northern New York State. Encroachment was identified as a strategic issue and emerging threat to readiness and training in the 2009 Fort Drum Growth Management Strategy as prepared for the FDRLO and continues to be addressed by several of the installation's strategic action goals. The objectives include public outreach to neighboring communities, seeking innovative partnerships, opening lines of communication, participating in key forums such as the Fort Drum Town Hall Meetings, and various state and county forums. Fort Drum has a strong relationship with surrounding communities, which ensures the installation remains informed of any planned development in the vicinity of the installation's boundaries. This relationship affords Fort Drum the opportunity to address concerns with local planning boards prior to the development taking place. FDRLO has backed the Fort Drum Regional Growth Management Strategy Plan project which links community with Fort Drum in making decisions that allow Fort Drum to operate un-encroached while the community enjoys economic growth.</p>						

Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)**Fort Drum Detailed Comments****Capability Observations**

Attributes	Assigned Training Mission	Score	Comments
Collective Ranges	Movement and Maneuver	●	Fort Drum does not have a RECCE range or a CLFX range as required and only has one IPBC. Fort Drum has requested the addition of a second IPBC, RECCE and CLFX Range in the Range Complex Master Plan in order to meet training requirements. Fort Drum currently utilizes the two multi-purpose training ranges and multi-purpose range complex to ensure units can conduct platoon size training events.
Suite of Ranges	Movement and Maneuver	●	Due to utilizing one IPBC, two MPTRs and one MPRC-L to support all collective training platoon-level and above, throughput capabilities are reduced. Unstabilized gunnery must compete with aviation gunnery and convoy live fire on one non-instrumented MPRC-L, while IBCTs compete for utilization of the IPBC and two MPTRs to meet platoon through company live fire requirements.

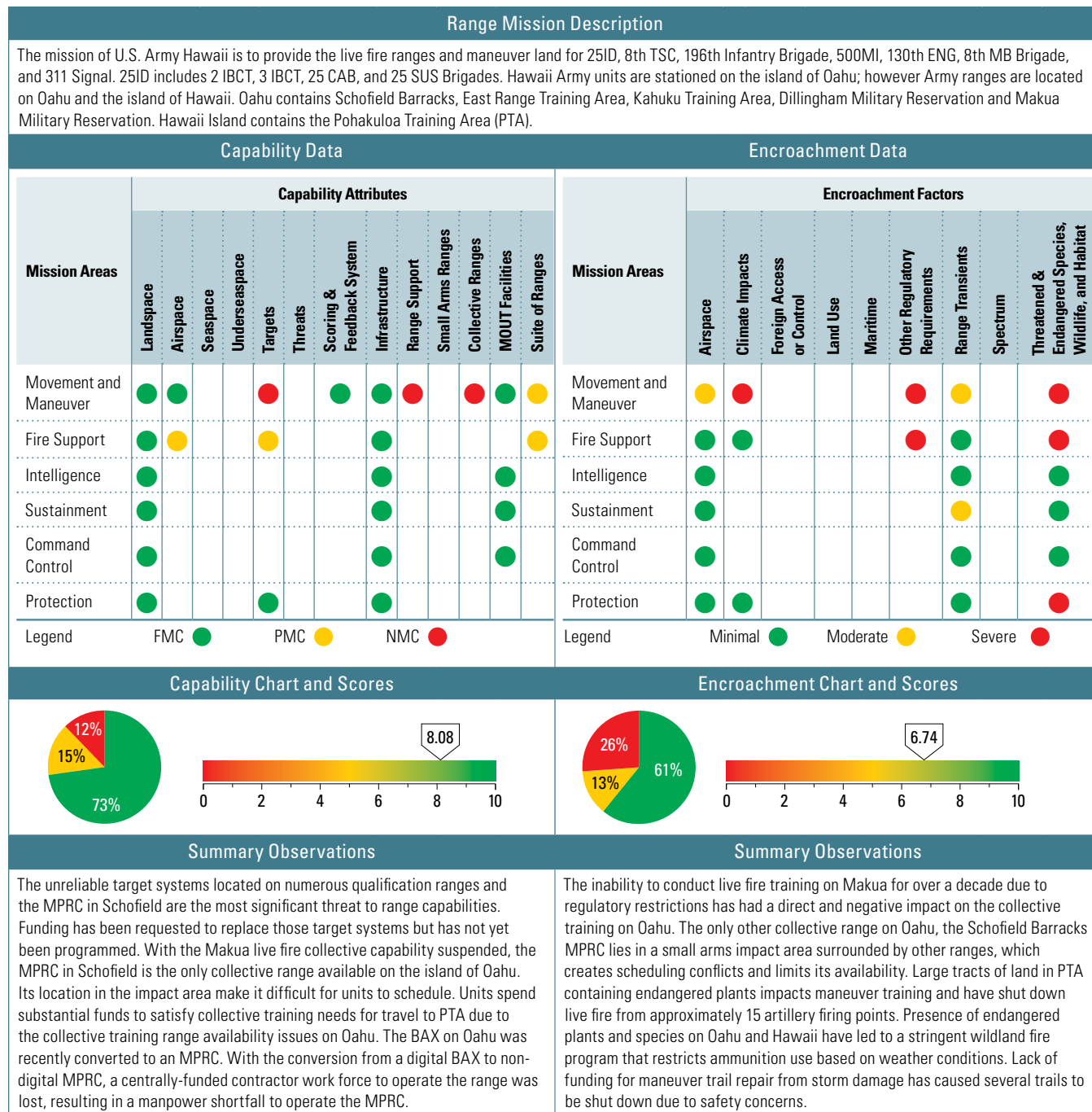
Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
No comments.			

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Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

Hawaii Assessment Details



Hawaii Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	N/A	N/A	7.67	8.66	9.15	9.15	Encroachment Scores	N/A	N/A	8.78	8.67	8.78	8.53
Funding for U.S. Army Hawaii Ranges increased slightly for 2017. The funding was provided to complete small projects associated with the PTA BAX to support aviation gunnery until an aviation gunnery range can be programmed and constructed.							Overall encroachment pressure for U.S. Army Hawaii (USAG-HI) is increasing. USAG-HI DPW Environmental is working towards completion of a programmatic agreement (PA) for training on Oahu, which should relieve some of the workload associated with Section 106 consultations associated with cultural resources. USAG-PTA DPW Cultural Resources is also working on a PA for training at PTA, but its completion will lag behind Oahu by several months. The biological assessment (BA) and biological opinion (BO) for Oahu are currently under revision and discussions are ongoing with the USFWS. Most notable item in the BA/BO pertaining to ranges and training is the request for use of short-range training ammunition (SRTA) in Kahuku, Dillingham and East Range. Range Division has received numerous requests for use of SRTA in non live fire training areas over the past year but could not approve its use due to restrictions in the BO.						

Hawaii Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Airspace	Fire Support	●	Restricted airspace is limited. The lack of restricted airspace on Schofield Barracks prohibits 155MM high angle field artillery firing. Units must travel to Hawaii Island to conduct 155MM high angle field artillery firing; there are no plans in place to correct the deficiency at Schofield Barracks.
Targets	Movement and Maneuver	●	Current MOUT facility lacks instrumentation to provide quality AAR process. Unable to conduct training to Army standards. Currently installing instrumentation and waiting for power upgrade of 6 buildings. Upgrade was scheduled to be complete October 15, 2010.
	Fire Support	●	25 Division Artillery lacks targets in the impact area at PTA. This limits the ability to engage multiple targets. USAG-HI is planning insertion of additional artillery targets this calendar year with an expected completion by November 2017.
Range Support	Movement and Maneuver	●	The BAX on Oahu was recently converted to a MPRC. With the conversion from a digital BAX to a non-digital MPRC, a centrally funded contractor work force to operate the range was lost. Range Division has not received any additional manpower to operate this range. USARPAC will address this manpower issue, via the Army's TSMR process.
Collective Ranges	Movement and Maneuver	●	The newest collective range for Oahu, the BAX, was converted to a MPRC and is located in the impact area for West Range on Schofield. When the MPRC is in use, other ranges in West Range must be closed due to conflicting Surface Danger Zones (SDZs). Depending on the training scenario, use of the MPRC may shut down all other ranges in West Range. This challenge, combined with the Makua restrictions described on the encroachment tab, severely restricts the ability to conduct collective training on Oahu. Units are forced to spend excessive funds to travel to PTA to conduct training that should be completed on Oahu.
Suite of Ranges	Movement and Maneuver	●	Many of the ranges on Schofield Barracks and PTA were built using self help. They provide a training site for units but do not meet the Army's Training Circular (TC) 25-8 standards for range design. Units do not get the standard design in distance or quantity of targets found in a standard range. Due to land restrictions there is not an immediate solution to this problem. U.S. Army Hawaii lacks a dedicated aviation gunnery range. 25 CAB currently uses the PTA BAX to complete gunnery training and qualification. An aviation add on package is planned for the PTA BAX but a timeline has not been finalized for the aviation upgrade.
	Fire Support	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Movement and Maneuver	●	Aviation training in certain areas of Schofield Barracks East Range must comply with noise abatement. Compliance with the abatement necessitates using other areas for certain types of training. No action is planned to remedy this item. Wind farm development on Oahu is impacting aviation training. Areas most impacted by wind farm development include the Tactical Flight Corridor and Kahuku Training Area (KTA). USAG-HI has actively participated in an OSD Mitigation Response Team (MRT) to mitigate impacts of a proposed windfarm, which is adjacent to KTA.
Climate Impacts	Movement and Maneuver	●	Heavy rain events have closed multiple maneuver trails on Oahu and Hawaii Islands. Units must utilize alternate routes or different locations due to trail closures. Additional funding has been requested, but not provided.

Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

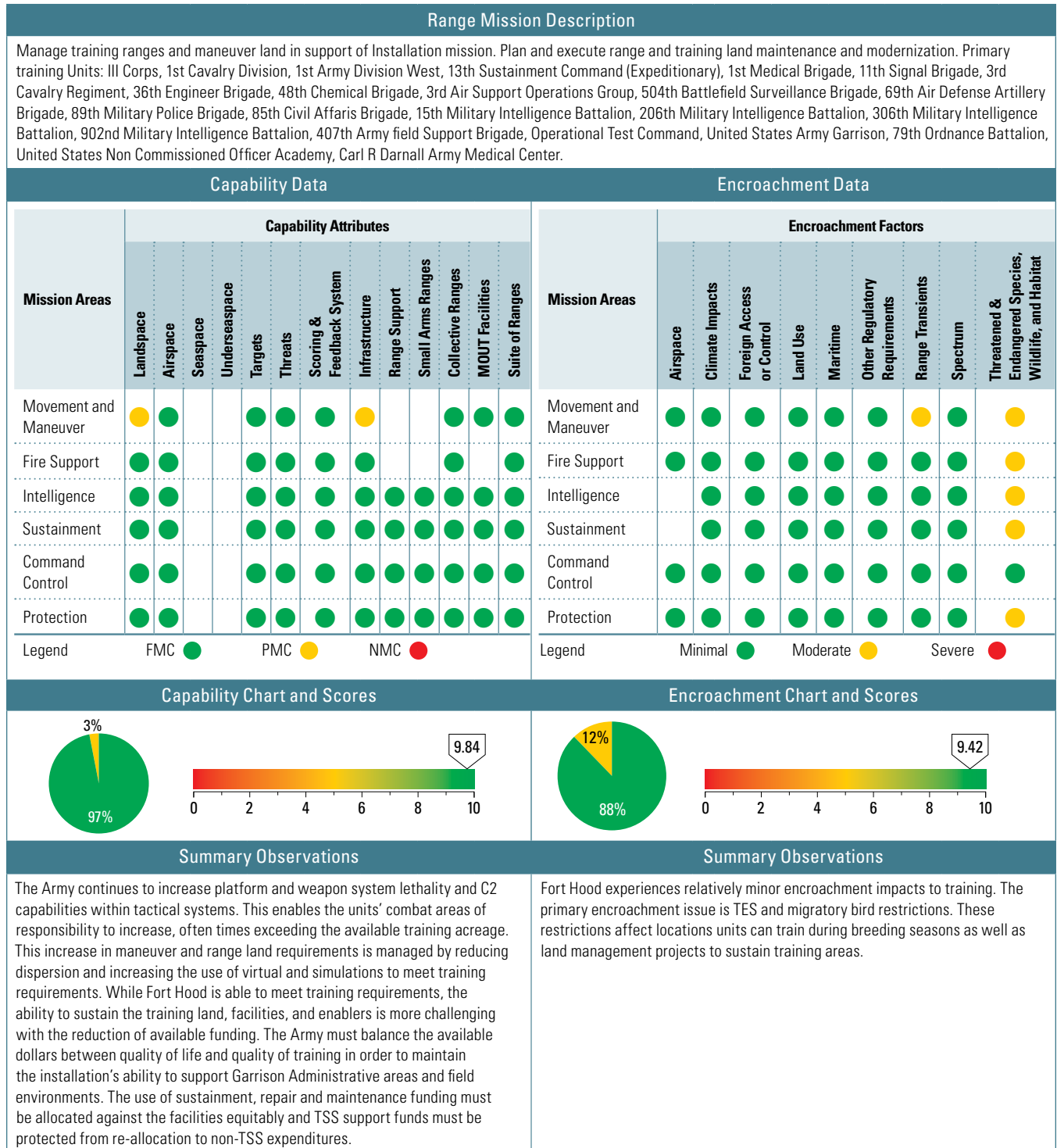
Hawaii Detailed Comments

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Other Regulatory Requirements	Movement and Maneuver	●	Makua Military Reservation has had live fire suspended for over 13 years due to legal challenges associated with cultural resources. Makua provides Company-level live fire exercise capability on Oahu. The MPRC on Oahu can provide this capability but its use closes out all other live fire ranges in Schofield West Range. Units are funding travel to PTA for collective training that could be done on Oahu if Makua were restored to live fire capability. No resolution date for this problem is planned.
	Fire Support	●	Same as above. The PTA IPBC MILCON project is near completion. Use of field artillery and mortars on or near the IPBC was not consulted on with USFWS during preparation of the EIS. Separate consultations are now needed to allow use of those weapon systems on and near the IPBC. Expect to resolve this problem by early 2018.
Range Transients	Movement and Maneuver	●	Resuming live fire training at Makua continues to be delayed pending additional litigation over access to cultural sites. Live fire training activities are being conducted at alternate locations in Hawaii. Other training strategies are being pursued at Makua.
	Sustainment	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Movement and Maneuver	●	Significant sections of PTA have training limitations due to endangered plants. Units are restricted to maneuvering on existing roads due to endangered plants. No digging is authorized in these areas. Approximately 15 artillery firing points have had live fire suspended due to endangered plants. No solution or timeline is in place. Revision of the BA and BO are planned for 2018.
	Fire Support	●	Same as above.
	Protection	●	Significant sections of PTA have training limitations due to endangered plants. Units are restricted to maneuvering on existing trails due to endangered plants. No digging is authorized in these areas. No solution or timeline is in place. Revision of the BA and BO are planned for 2018.

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Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

Fort Hood Assessment Details



Fort Hood Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	5.33	5.33	7.44	9.22	9.22	9.75	Encroachment Scores	7.93	7.93	9.52	9.52	9.52	9.90
<p>Fort Hood's capability to support training has increased over the past ten years with the modernization of legacy ranges and the addition of new facilities: two shoothouses, three urban assault courses, one combined arms collective training facility and one digital multi purpose training range. Maneuver capability has increased with the thinning and brush removal projects, training area re-seeding, and gully plugs executed by the ITAM section. The installation continues to increase the availability of automated systems such as home station instrumentation systems to enhance maneuver tracking and evaluation, further enhancing capabilities. Fort Hood remains viable and relevant to support five maneuver brigades by allocating resources efficiently, incorporating virtual, simulations, gaming technologies, and continuing to maintain and enhance legacy ranges and maneuver training lands. The Range Complex Master Plan continues to plan for the modernization of ranges as funding becomes available to support major military construction programs in the out years.</p>							<p>Internal encroachment associated with TES and associated habitats has been well managed within the installation to accommodate training with minimal impacts. As a result of more than two decades of research and conservation work at Fort Hood on the Black Capped Vireo and Golden Cheek Warbler, internal encroachment associated with TES and associated habitats has been well managed within the installation to accommodate training with minimal impacts. The installation's ability to maintain training land and construct new ranges to Army standards is occasionally challenging due to the inability to perform work in TES habitat during TES nesting season which spans from 15 March through 15 August. Maintenance and land improvement projects are limited to 6 months, 16 August through 15 March, which requires careful planning to avoid TES nesting season.. External encroachment by communities is being addressed by the use of an ACUB plan to minimize land use practices that could conflict with critical military training activities conducted on Fort Hood. The main concerns arising from incompatible land use are the restrictions that could be imposed upon the heavy military training activities conducted on Fort Hood as a result of development adjacent to the installation boundary. These restrictions could result from noise, night training, pyrotechnics use, and air quality degradation. The cities of Killeen, Copperas Cove, and Gatesville are experiencing rapid growth, which threatens to spread along the boundaries of Fort Hood, particularly along the western boundary, adjacent to the primary maneuver lands. Continued action to address the expansion by preserving the compatible land use practices associated with these areas is critical to the training mission at the installation.</p>						

Fort Hood Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landscape	Movement and Maneuver	●	Physical land available for maneuver training land is less than required to support one Heavy and one Light Brigade Combat Team (BCT) in maneuver beyond Company level; however, all required maneuver training is accomplished by reduced spacing, gated training strategy, and/or the use of virtual and constructive training events. Approximately 83,167 acres of TAs have woody vegetation constraints impacting MILES gear. Units cannot conduct training doctrinal dispersion distances, MILES engagements are degraded, and survivability measures are simulated. Training is conducted with reduced distance and the use of virtual training is increased. All in-ground survivability is simulated with above ground structures. There are no land acquisitions currently proposed.
Infrastructure	Movement and Maneuver	●	Current funding levels result in approximately 161 miles of tank trails in need of repair and unserviceable hillside access trails and stream & pipeline crossings; bridges exist with insufficient load class capabilities to support armored vehicles. Training is conducted at increased risk levels due to lack of infrastructure maintenance. OPTEMPO miles increase to access training areas where bridge load class can support armored vehicle traffic. MILCON projects are being requested by the DPW to repair bridges in the out years beyond 2019.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Range Transients	Movement and Maneuver	●	Bats have nested in legacy MOUT training and maintenance facilities. Many basements and underground training tunnels are uninhabitable for training. Funding is required to either demolish the unauthorized facilities or maintain the inventory not under PEO-STRI support.

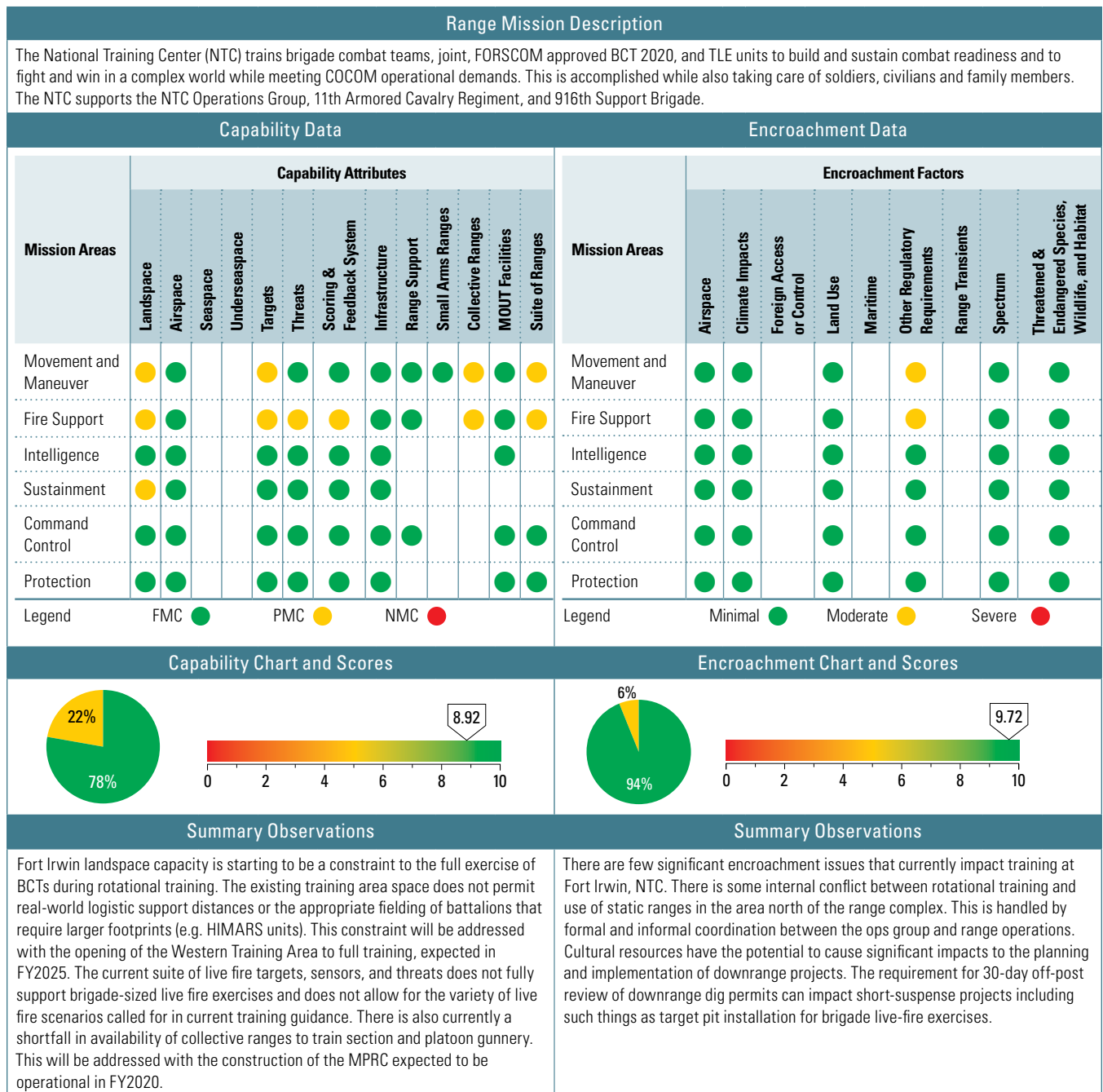
Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)**Fort Hood Detailed Comments**

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Threatened & Endangered Species, Wildlife, and Habitat	Movement and Maneuver	●	Due to Migratory Bird Treaty Act protections which are in effect from 15 March through 15 August, limitations to land reutilization and management of training lands impact the effective use of the MILES training capability. If vegetation is not maintained, MILES transmitters are unable to engage targets that operational ammunition would be able to, thus creating negative training effects. While there is no relief for endangered species nesting, work may proceed during migratory bird nesting season when biologists are present to conduct nest surveys in front of work crews.
	Fire Support	●	Same as above.
	Intelligence	●	Same as above.
	Sustainment	●	Same as above.
	Protection	●	Same as above.

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Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

Fort Irwin Assessment Details



Fort Irwin Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	7.45	7.45	7.84	8.70	8.70	8.36	Encroachment Scores	9.75	9.75	8.50	8.61	8.61	9.21
<p>NTC training capability has improved over the past several years. Since 2004, NTC has made remarkable strides to populate the training area with MOUT training sites emplaced to support current Overseas Contingency Operations in Iraq and Afghanistan. In FY2014 Fort Irwin began receiving augmented funding to upgrade and correct training deficiencies of the small arms/Goldstone Range Complex. This effort has resulted in new targetry (FY2014-FY2016), Enhanced Performance Round (EPR) SDZ mitigation (FY2015), and footprint layout (FY2016) that maximizes the MPRC capability. New Range Operations Control Area buildings (FY2017-FY2018), and a Range Control operations building planned for 2019 are future upgrades to enhance these capabilities. Fort Irwin MILCON projects completed and forecasted are Infantry Squad Battle Course completed in 2016, Qualification Training Range completed in 2016, and MPRC MILCON projected for 2019; however, there remains an inadequacy of crew-level and higher qualification capability, and the ability to address emerging requirements for our mounted forces. This shortfall is addressed in the approval of MILCON funding in 2019. The MPRC has a Beneficial Occupancy Date (BOD) of 2020. Combat Training Center (CTC) requirements continue to evolve at the NTC. The Headquarters, Department of the Army, G-3 Training will assess and address critical shortfalls in POM 20-24. Other major capability degradation is in the area of CTC infrastructure and equipment to support NTC rotation training mission. In the past, CTC modernization has been under-funded, impacting the up-keep of instrumentation, Tactical Engagement Simulation Systems, opposing force equipment, and live fire ranges at required capability to sustain training for rotating brigades. Recent improvements of fiber capabilities in the Eastern Training Area has led to increased usage of that area during rotational training. Infrastructure improvements throughout the box have reduced downtime and dead spots.</p>							<p>Spectrum encroachment has presented less of a constraint than in the recent past. Spectrum conflicts between NASA Goldstone and NTC are worked out on a case by case basis at the appropriate level. New systems/UAS utilized during DA rotations often require requesting frequencies from other neighboring DoD agencies; but this process is in place. Impacts to training from endangered species have been reduced over the last several iterations of the SRR. In 2012, the area set aside as desert tortoise habitat south of the 90 gridline was re-opened, resulting in an additional 20,000 acres for training. This area has been utilized to great advantage by rotational units during DA rotations. While access to the Western Training Area has been delayed since it was acquired in 2001, NTC and Fort Irwin are now actively moving toward opening that area to training as part of programmatic EIS. This EIS will encompass the current mission and foreseeable training activities and will lead to an overall reduction in encroachment. The associated programmatic agreement with SHPO will enable a streamlined approval process for many downrange dig permits. Looking forward, however, there are several species (e.g. Mojave ground squirrel [MGS], Mojave fringed-toed lizard [MFTL]) which, if listed, may cause impacts to training activities. Portions of the Western Training Area and central corridor have been suggested as MGS habitat, MFTL occurs in sandier areas in the southeast portion of post, if listed this would further constrain training. There are currently no significant encroachment issues stemming from adjacent land use. The Desert Protection Act, which would set aside wilderness areas to the southeast, east, and northeast, has been introduced several times. If enacted, it would likely constrain live-fire and aviation activities (including CAS) in the eastern portions of post.</p>						

Fort Irwin Detailed Comment

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Movement and Maneuver	●	There is not enough room to accommodate 4 MLRS/HIMARS battalions, resulting in the need for scenario workarounds. This issue will be improved once the Western Training Area is open for HIMARS by FY2025.
	Fire Support	●	There is not enough room to support live fire scenarios that fully exercise entire brigades and allow different scenarios from rotation to rotation. This landspace limitation requires workarounds. The ops group has recommended clearing and opening Leach Lake Impact Area but this may be cost prohibitive and no date has been set.
	Sustainment	●	There is not enough landspace to conduct exercises and there is stress on logistic support functions. Logistics functions are tested by implementing somewhat unrealistic scenarios. This will improve with the opening of the Western Training Area in FY2025, as it can be used for tactical assembly areas.
Targets	Movement and Maneuver	●	Not all targets are Future Army System of Integrated Targets (FASIT) compliant and there are not enough target locations to fully engage a BCT. The result is the need to conduct modified live fire scenarios. A live fire target upgrade is in progress with completion scheduled for FY2020.
	Fire Support	●	Same as above.
Threats	Fire Support	●	There are not enough target locations to fully engage a BCT. The result is the need to conduct modified live fire scenarios. A live fire target upgrade is in progress with completion scheduled for FY2020.
Scoring & Feedback System	Fire Support	●	Not all targets are FASIT compliant and there are not enough target locations to fully engage a BCT. The result is the need to conduct modified live fire scenarios. A live fire target upgrade is in progress with completion scheduled for FY2020.
Collective Ranges	Movement and Maneuver	●	There remains an inadequacy of crew-level and higher qualification capability, or the ability to address emerging requirements for our mounted forces. This shortfall is addressed in the approval and funding of the MPRC with MILCON funding in 2019.
	Fire Support	●	Same as above.

Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)**Fort Irwin Detailed Comments****Capability Observations**

Attributes	Assigned Training Mission	Score	Comments
Suite of Ranges	Movement and Maneuver	●	Current facilities are insufficient to train section and platoon gunnery on the static ranges. As a result, units must travel to the northern live fire corridor to complete qualification. The MPRC being constructed will provide a remedy and will be available by FY2020
	Fire Support	●	Same as above.

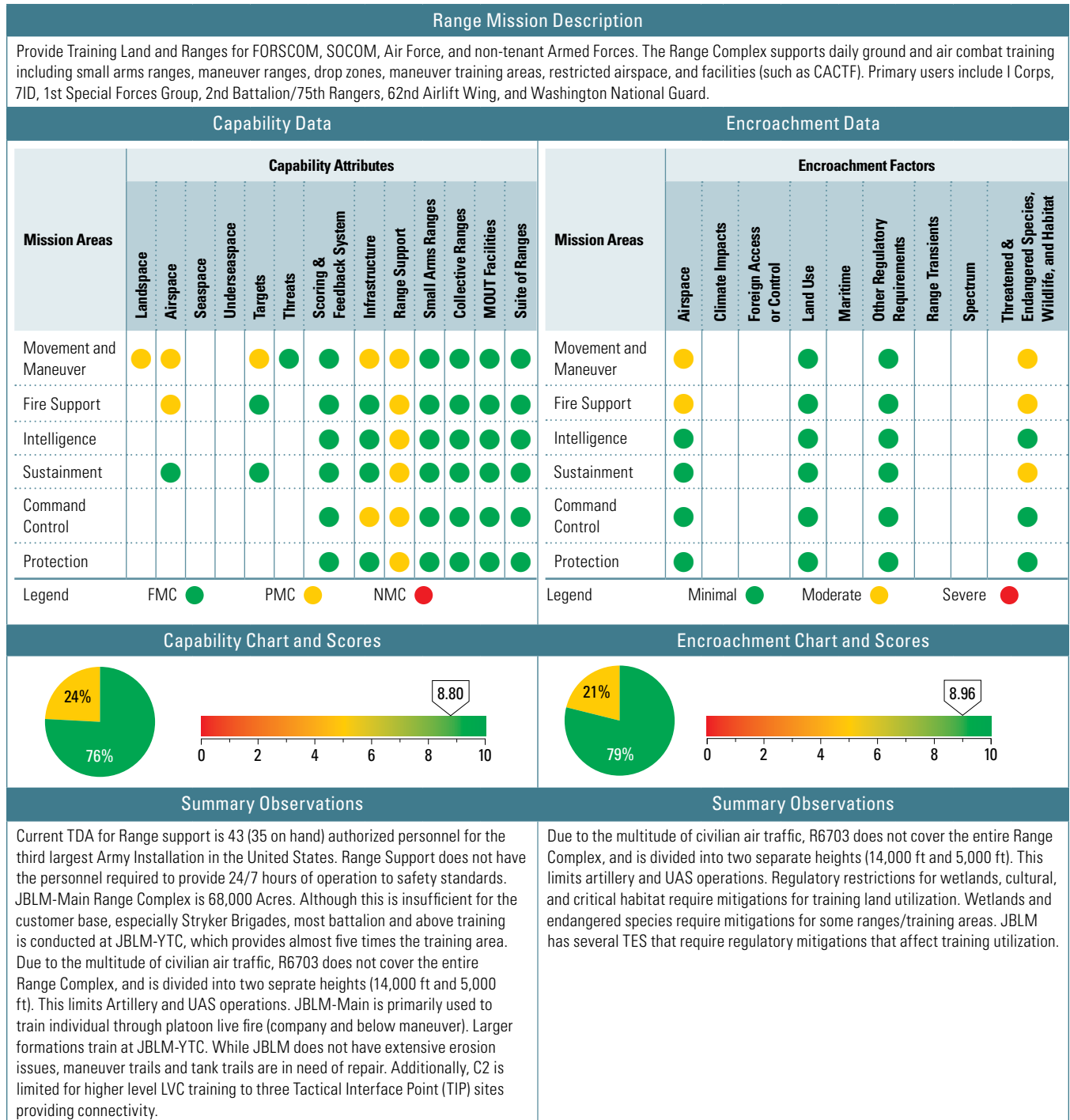
Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Other Regulatory Requirements	Movement and Maneuver	●	Cultural resource sites do not significantly impact maneuver, but they do impact planning and implementation of downrange projects because of the delay approval of dig permits. Some downrange projects are delayed due to cultural resource site issues. DPW-CR is conducting surveys in locations most likely to be impacted by future downrange projects.
	Fire Support	●	Currently identified cultural resource sites have little impact on live fire operations. Identified areas can generally be worked around within the scope of the tactical scenario with minimal impact to rotational training. Cultural resource sites do cause delays in the approval of dig permits for target pits. Further encroachment from newly identified sites in critical training areas such as the central corridor may have significant impacts on future target planning. New targets cannot be installed in the timeframe required and occasionally must be moved to avoid cultural sites. DPW-CR is currently working with Phoenix team to pre-survey areas where targets are planned and is providing Phoenix team with maps of which areas have already been cleared.

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Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

Joint Base Lewis-McChord (JBLM) Assessment Details



Joint Base Lewis-McChord (JBLM) Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	7.67	7.67	6.56	8.33	8.33	8.18	Encroachment Scores	8.54	8.54	9.15	8.57	8.57	9.39
Range Support Manning is the primary factor diminishing the Installation's capabilities within the Range Complex. With a TDA of only 43 (35 on hand) personnel, Range Support cannot safely support 24/7 operations. JBLM-Main and JBLM-YTC are receiving a combined additional 67 authorizations in FY2019 which can be hired against beginning in FY2018. Airspace is limited, both restricted airspace R6703 and within the confines of the Installation. Attempts are being made to acquire rights to off-post training areas for rotary wing aircraft. Collective Ranges do not have permanently installed targetry.							Encroachment pressures have increased due to the listing of three species: Streaked Horned lark (<i>Eremophila alpestris strigata</i>), Taylor's Checkerspot Butterfly (<i>Euphydryas editha taylori</i>) and Mazama pocket gopher (<i>Thomomys mazama</i>), subspecies <i>yelmensis</i> and <i>glacialis</i> . Mitigation for the endangered species includes ACUB funding to provide additional habitat off the installation, a Programmatic BA for all training events occurring in occupied habitat, and deforestation to provide additional open maneuver areas outside of occupied habitat.						

JBLM Detailed Comments

Capability Observations

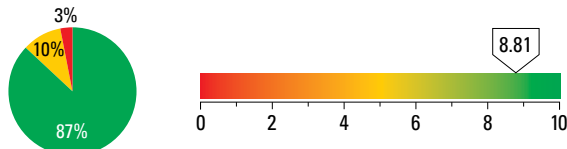
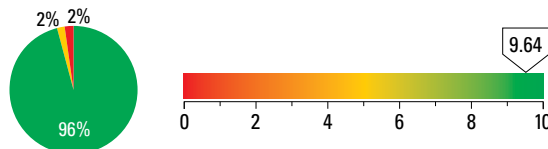
Attributes	Assigned Training Mission	Score	Comments
Landspace	Movement and Maneuver	●	Stryker Brigades require huge footprints of land doctrinally. JBLM-Main has 68,000 acres of training land. Impact is minimal, as larger formations generally train at JBLM-YTC. There is no further mitigation since JBLM was designed with both Main and YTC as complementary.
Airspace	Movement and Maneuver	●	Airspace, especially restricted airspace, is limited at JBLM-Main. Rotary wing training is competing for much of the same resource with UAS and Artillery. An EA is required for acquisition of off-Installation rotary wing training sites.
	Fire Support	●	Restricted airspace R6703 does not provide for full spectrum indirect fire training. Only two training areas are capable of firing high angle indirect missions (up to 14,000 ft.). Only one additional training area available for indirect missions, and only to 5000 ft. JBLM-Main mitigates this by training at other locations.
Targets	Movement and Maneuver	●	Targetry and range limitations are unable to support full Stryker Gunnery per TC 3-20.31. Units perform most gunnery tasks (IV-VI) at YTC. Modified gunnery at R53, which is insufficient (no movers, limited maneuver, dispersion of targets). The remedy is to rebuild R53 into a (modified) MPRC and qualification range as a MILCON project in FY2023.
Infrastructure	Movement and Maneuver	●	Tank trails are in disrepair. Vehicles must navigate wide portions and potholes. Funding has been requested for tank trail repair.
	Command Control	●	LVC architecture is deficient as there is limited connectivity for LVC. This is affecting JBLM-Main's ability to provide reliable Command Control training. This will be mitigated by installing a fourth TIP Site in TA12.
Range Support	Movement and Maneuver	●	There is currently insufficient range support personnel to safely provide 24/7 coverage of the range complex. Training is not allowed while Range Support is closed, making certain long term training activities infeasible. JBLM-Main and JBLM-YTC are receiving a combined additional 67 authorizations in FY2019 which can be hired against beginning in FY2018.
	Fire Support	●	Same as above.
	Intelligence	●	Same as above.
	Sustainment	●	Same as above.
	Command Control	●	Same as above.
	Protection	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Movement and Maneuver	●	Airspace, especially restricted airspace, is limited at JBLM-Main. Rotary wing training is competing for much of the same resource with UAS and artillery. An EA is required for acquisition of off-Installation rotary wing training sites.
	Fire Support	●	Restricted airspace R6703 does not provide for full spectrum indirect fire training. Only two training areas are capable of firing high angle indirect missions (up to 14,000 ft.). Only one additional training area available for indirect missions, and only to 5000 ft. JBLM-Main mitigates this by training at other locations.
Threatened & Endangered Species, Wildlife, and Habitat	Movement and Maneuver	●	The current BA restricts maneuver activities within occupied or critical habitat. Vehicles must stay on roads or trails when in these habitat. The BA is reviewed quarterly, over the next 5 years for sustainability.
	Fire Support	●	Same as above.
	Sustainment	●	Same as above.

Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

Fort Polk Assessment Details

Range Mission Description																								
The primary mission of Fort Polk Range Operations is to support the Joint Readiness Training Center's (JRTC) advanced-level joint training for Army, Air Force, Army National Guard, Navy, and Marine units under conditions that simulate low- and mid-intensity conflicts. The JRTC is a key part of the Army's CTCs, and training at the JRTC is focused on Army light, airborne, and air assault forces.																								
Capability Data													Encroachment Data											
Mission Areas		Capability Attributes											Mission Areas		Encroachment Factors									
		Landspace	Airspace	Seaspace	Underseaspace	Targets	Threats	Scoring & Feedback System	Infrastructure	Range Support	Small Arms Ranges	Collective Ranges			MOUT Facilities	Suite of Ranges	Airspace	Climate Impacts	Foreign Access or Control	Land Use	Maritime	Other Regulatory Requirements	Range Transients	Spectrum
Movement and Maneuver		●	●			●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●
Fire Support		●	●			●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●
Intelligence		●	●			●	●		●	●		●	●	●	●	●	●		●		●	●	●	●
Sustainment		●				●		●	●	●	●	●	●	●	●	●	●		●		●	●	●	●
Command Control		●	●			●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●
Protection		●	●					●	●	●	●	●	●	●	●	●	●		●		●	●	●	●
Legend		FMC ● PMC ● NMC ●											Legend Minimal ● Moderate ● Severe ●											
Capability Chart and Scores													Encroachment Chart and Scores											
																								
Summary Observations													Summary Observations											
Current range control manpower authorization is not adequate to support the JRTC and Sustainable Ranges Program mission. Maintaining and sustaining range complex resources has become more complex as organizations reduce levels of service. Manning of the fire control desk and safety techs is a 24/7 requirement 365 days a year, as opposed to 16 hours, five days a week, 242 days a year. This is causing a challenge to employee scheduling and increasing cost for overtime, particularly during box cleanup. CTC requirements outpace the ability to provide support in a timely manner. The increase in FY2019 authorizations will provide significant relief to the range support challenges.													Approximately 700 trespass horses live on Fort Polk and Peason training lands and ranges. While not a TES, they are hazardous to airborne activities, maneuvers, live fire, and to land rehabilitation and maintenance activities. Sixty-five horses were removed by the Humane Society of West Texas in the fall of 2016 before a complaint was filed in U.S. District Court of Louisiana. Low stress capture efforts will continue while awaiting the decision to transfer the lawsuit from the Middle District to the Western District of Louisiana.											
Historical Information, Results, and Future Projections													Historical Information, Results, and Future Projections											
Calendar Year		2008	2009	2010	2011	2012	2015	Calendar Year		2008	2009	2010	2011	2012	2015									
Capability Scores		8.73	8.73	7.94	9.33	9.33	9.42	Encroachment Scores		10.00	10.00	9.51	9.51	9.51	9.52									
Overall capabilities have continued to slowly increase through better business practices and in particular a monthly, interdisciplinary, review of the Senior Commander's priorities that includes DPW, DPTMS, Commander of Operations Group, and the JRTC G3. Landspace development has improved due in large part to the Senior Commander's use of funds to execute road improvement and ITAM's competent execution of their trail and open area workplans.													Encroachment pressures remain steady as the reproduction rate of the trespass horses remain even with the number of horses removed from the training lands and ranges. Woody vegetation is being addressed but gains in open areas and clear lines of site remain small due to the area's long growing season.											

Fort Polk Detailed Comments

Capability Observations

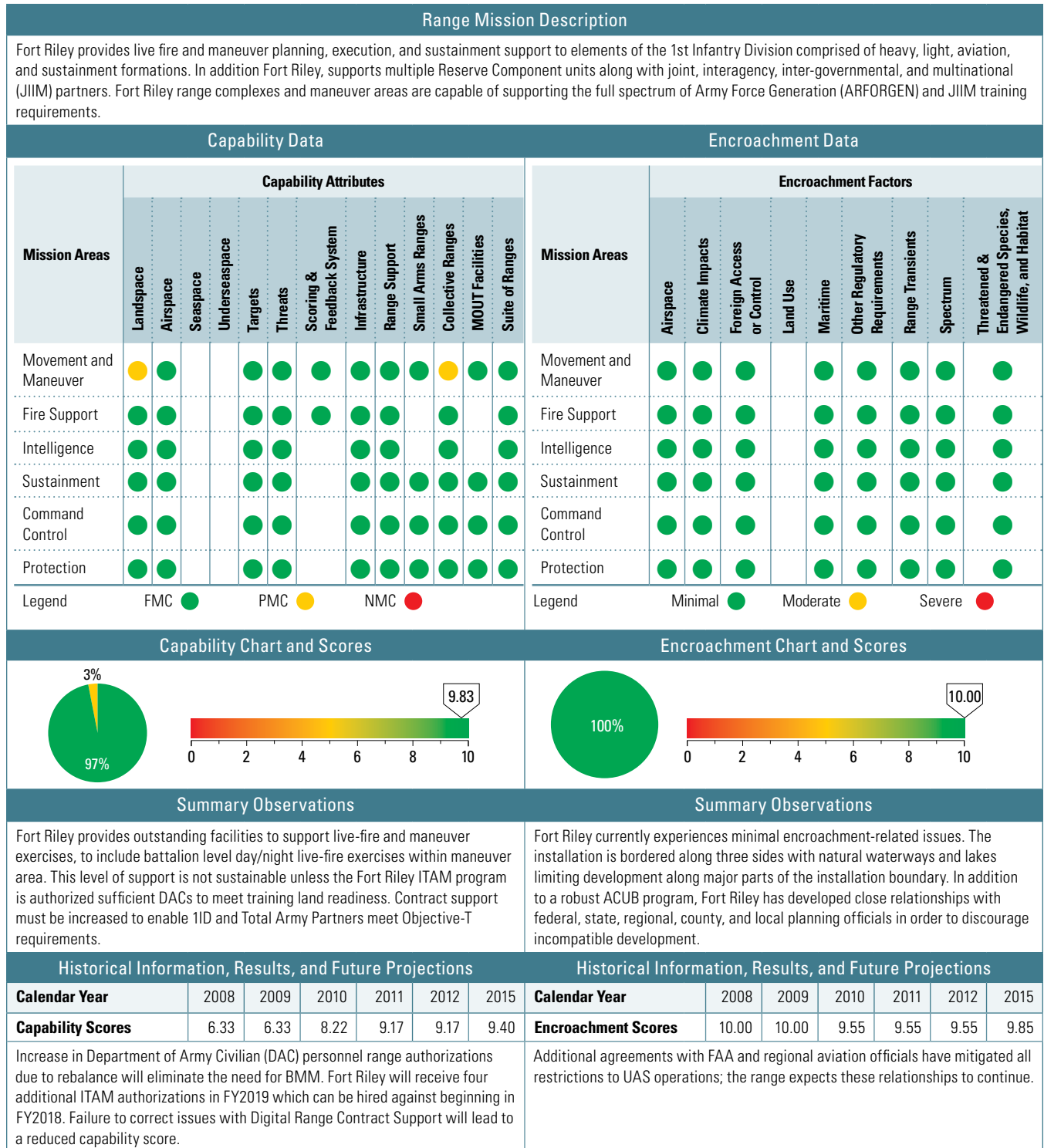
Attributes	Assigned Training Mission	Score	Comments
Airspace	Movement and Maneuver	●	There is no restricted airspace established over the newly purchases lands. Without restricted airspace, Fort Polk cannot integrate direct and indirect fire or UAVs into training. The EA for restricted airspace was initiated as well as preliminary coordination with the FAA through the Department of the Army for restricted airspace. Once all inholdings are purchased, the proposal will go to FAA Headquarters for ruling and publishing. A SARSA is in place over a portion of the new purchase in order to support small arms fire.
	Fire Support	●	Same as above.
Range Support	Movement and Maneuver	●	Range control cannot fully execute mission support for both the JRTC and tenant units without judicious use of overtime and JRTC funds. Small MOU facilities are in a state of disrepair with no maintenance tail and negatively affect unit readiness due to safety concerns. Senior Commander priorities present challenges to execute both JRTC and Sustainable Ranges Program missions, given the size of the current workforce. Manpower requirements are 95 personnel with an authorized staffing of 49. Remodeled personnel authorizations for FY2019 will provide 35 additional authorizations which can be hired against beginning in FY2018.
	Fire Support	●	Same as above.
	Intelligence	●	Same as above.
	Sustainment	●	Same as above.
	Command Control	●	Same as above.
	Protection	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Range Transients	Movement and Maneuver	●	Range transients on Fort Polk include trespass horses and feral hogs. Trespass horses pose the greatest risk to the safety of training events and in particular to airborne and aviation operations on drop zones and Helicopter Landing Zones (HLZs). Fort Polk completed NEPA analysis and the Senior Commander made a final decision to remove trespass horse from the government owned lands. A complaint was filed in U.S. District Court for the Middle District of Louisiana against the Department of the Army and the installation and Fort Polk is now awaiting a final decision from courts.
Threatened & Endangered Species, Wildlife, and Habitat	Movement and Maneuver	●	The RCW is present and well protected on Fort Polk. Colonies occur throughout the maneuver lands and are well marked. The Louisiana pine snake is also present and has recently been listed as a candidate species by the State of Louisiana. At this time there are no restrictions to training to protect the Louisiana pine snake. The potential for restrictions to sustainable maintenance down range is an issue. There is a candidate conservation agreement in place that provides protection to the snake.

Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

Fort Riley Assessment Details



Fort Riley Detailed Comments

Capability Observations

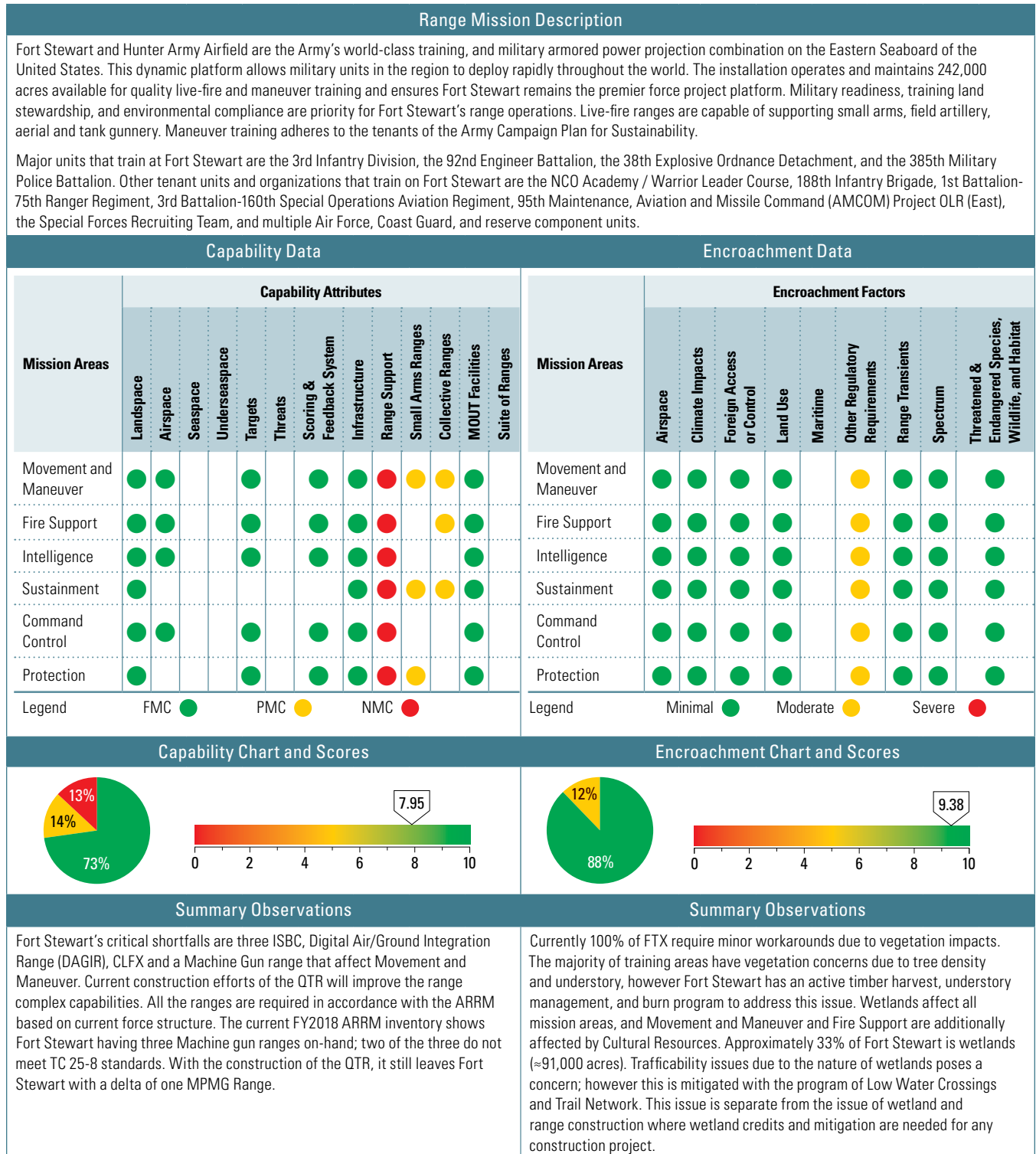
Attributes	Assigned Training Mission	Score	Comments
Landscape	Movement and Maneuver	●	DAC personnel authorizations for the Fort Riley ITAM program had been reduced from seven to five (four of which are term positions), severely limiting the ability to conduct RTLA and LRAM activities concurrently. Secretary of the Army policy and federal regulations prohibit Fort Riley from contracting ITAM support. Fort Riley has requested two of the four additional authorizations to be wage grade heavy equipment operator positions to enable field crew work. IMCOM and HQDA approved the transition. Fort Riley is currently meeting all decisive action training requirements by leveraging additional repair support from active and reserve component engineer units.
Collective Ranges	Movement and Maneuver	●	Contract support for digital ranges is insufficient to meet 11D and Total Army gunnery requirements. Fort Riley is currently meeting requirements by executing CPF 11 and shutting down CCTT, CACTF, AVCATT, HITS and the shoot houses during gunnery densities. In addition, Commanders are waiving standardized tables and executing gunnery on ranges that do not meet requirements. The long-term solution includes the development of a programmatic system that surges contract resources between installations during gunnery densities.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
No comments.			

Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

Fort Stewart Assessment Details



Fort Stewart Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	6.33	6.33	6.89	8.81	9.40	7.21	Encroachment Scores	9.17	9.17	8.61	7.72	7.72	8.48
As an installation that supports heavy forces, Fort Stewart has traditionally focused its range upgrade program to Tank and Bradley ranges. Fort Stewart has struggled to keep pace with the increased requirements placed upon it from ARFORGEN, modularity, and now the SRM. The installation assumes risk due to incomplete and inadequate facilities for our growing mission and population. Fort Stewart does not have the manpower in both DACs and War Fighter Focus (WFF) contractors necessary to support current or future force levels. Fort Stewart will receive 40 additional authorizations in FY2019 which can be hired against beginning in FY2018. Modern training facilities are critical to train the force for successive deployments as part of the SRM.							With the Removal of Restriction on RCW in Maneuver Areas, there is negligible TES concerns. Potential listing of the gopher tortoise as an endangered species would have a moderate to significant impact on training. This is unlikely to occur in the next 5 years but Fort Stewart and HQDA must remain actively engaged in regional conservation efforts to prevent such listing.						

Fort Stewart Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Range Support	Movement and Maneuver	●	Non-salary range operation funding is 25 percent below the Army critical requirement. This limits installation support for short-term training requests, range reconfiguration projects to support emerging TTPs, and preventive maintenance. Fort Stewart is receiving 40 additional authorizations in FY2019 which can be hired against beginning in FY2018. Non tenant organizations will pay operation and maintenance cost for use of range facilities.
	Fire Support	●	Same as above.
	Intelligence	●	Same as above.
	Sustainment	●	Same as above.
	Command Control	●	Same as above.
	Protection	●	Same as above.
Small Arms Ranges	Movement and Maneuver	●	Fort Stewart has a deficit of machine gun range upgrades. Fort Stewart's machine gun range currently does not meet the training requirements as outlined in TC 25-8. Our training throughput requirements call for a total of 3 machinegun ranges. Without these facilities Soldiers cannot perform the collective tasks required of basic combat units. This leaves Ft Stewart with a throughput issue and an inability to meet "to standard" training requirements during deployment preparations and mobilizations. There are no plans to upgrade the current range to TC 25-8 standards. The QTR range project went out for bid 16 May 17 with an estimated completion date in FY2019. The FY2013 MCA machine gun range scheduled for construction was cancelled by HQDA due to FORSCOM priority shifts.
	Sustainment	●	Same as above.
	Protection	●	Same as above.
Collective Ranges	Movement and Maneuver	●	Fort Stewart has a deficit of Infantry platoon/squad ranges. Fort Stewart is authorized three ISBC and two IPBC. There are only two IPBCs on-hand and one currently does not meet the training requirements as outlined in TC 25-8. The revised FYDP through FY2018 leaves Ft Stewart with a shortage of three ISBCs. These training shortfalls are being addressed in the Senior Commanders Installation Needs and Issues report to Department of the Army. Fort Stewart is building an ISBC with OMA funding in FY2017.
	Fire Support	●	Same as above.
	Sustainment	●	Same as above.

Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

Fort Stewart Detailed Comments

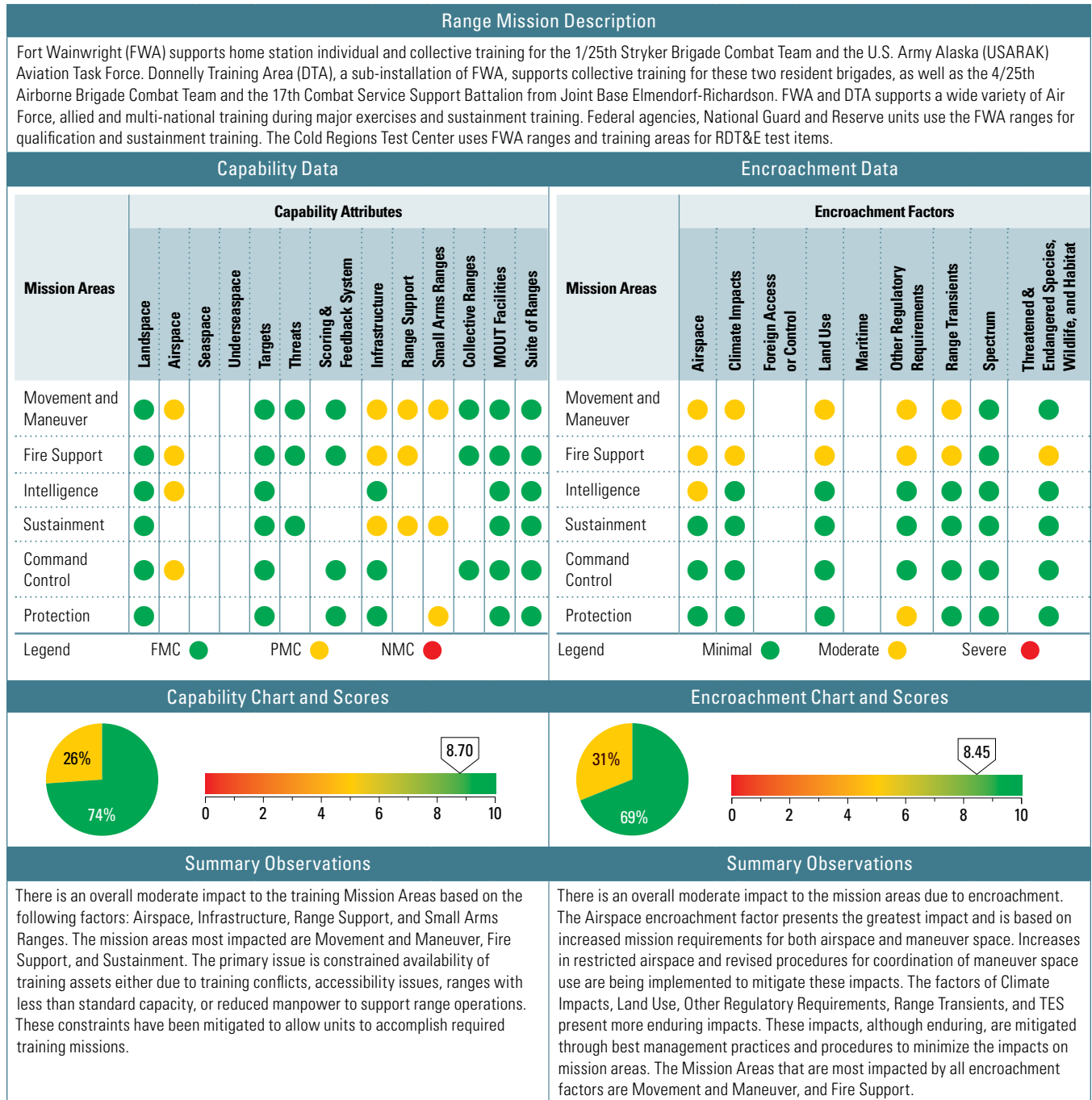
Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Other Regulatory Requirements	Movement and Maneuver	●	<p>Approximately 33% of Fort Stewart is wetlands (~91,000 acres). Trafficability issues due to nature of wetlands pose a concern; however this is mitigated with the program of low water crossings and trail network. This issue is separate from the issue of wetland and range construction where wetland credits and mitigation are needed for any construction project. Additional wetland areas are being purchased to mitigate wetland impact from future range construction projects. Trafficability in wetlands is a concern, however this is mitigated with the program of low water crossings and trail network. This issue is separate from the issue of wetland and range construction where wetland credits and mitigation are needed for any construction project. Additional wetland areas are being purchased to mitigate wetland impact from future range construction projects.</p> <p>There are 198 protected sites and cemeteries which occupy approximately 1000 acres (0.04 percent) of land that have training restrictions. No training is allowed in the approximately 1000 acres of cultural resources sites. The Army continues to work to mitigate these restricted areas.</p>
	Fire Support	●	Same as above.
	Intelligence	●	Approximately 33% of Fort Stewart is wetlands (~91,000 acres). Trafficability issues due to nature of wetlands pose a concern; however this is mitigated with the program of low water crossings and trail network. This issue is separate from the issue of wetland and range construction where wetland credits and mitigation are needed for any construction project. Additional wetland areas are being purchased to mitigate wetland impact from future range construction projects. Trafficability in wetlands is a concern, however this is mitigated with the program of low water crossings and trail network. This issue is separate from the issue of wetland and range construction where wetland credits and mitigation are needed for any construction project. Additional wetland areas are being purchased to mitigate wetland impact from future range construction projects.
	Sustainment	●	Same as above.
	Command Control	●	Same as above.
	Protection	●	Same as above.

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Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

Fort Wainwright Assessment Details



Fort Wainwright Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	8.22	8.22	8.00	8.93	9.17	9.42	Encroachment Scores	8.46	8.46	9.00	9.35	9.35	9.48
<p>There is a lack of restricted airspace to support numerous activities throughout the installation, which require the training units to meet specific weather minimums based on ordnance being utilized. In addition, there are uncontrolled aircraft operating over Army owned training lands outside of restricted Airspace. This leads to regular cease fires for live-fire training. The limited restricted airspace also restricts the area UAS operations can be operated over Army lands, limiting the support UAS units can provide home station elements during consolidated training events is reduced. The road infrastructure does not provide suitable driving conditions for modern fighting vehicles. Road infrastructure projects were submitted to address this situation. Historically, road improvement projects have been underfunded. The 45 percent reduction in manning has significantly affected range supportability, but is programmed for improvement in FY2019. Small arms ranges are currently programmed for modernization to prevent equipment failure during critical reset times. Small arms range modernization and re-vitalization projects are identified in the Range Complex Master Plan.</p>							<p>Encroachment factors have historically had a moderate impact on the mission at FWA, but they have increased slightly this year. The installation has been able to manage and mitigate many encroachment impacts. The installation continues working to expand restricted airspace to reduce the airspace encroachment on the training mission. The installation's airspace expansion request to the FAA is expected to be finalized in 2017. The completion of the Tanana River Bridge has provided access to areas of the Tanana Flats that were previously inaccessible by ground. Wetlands will significantly impact the ability to develop access routes into this area however a mission wetlands permit will help mitigate time constraints and costs. Fire Weather Index restrictions on munitions use remains a constant constraint to training during the fire season (April – September). Atypical weather events and associated impacts are an evolving factor that will have an effect on future infrastructure and operations.</p>						

Fort Wainwright Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Airspace	Movement and Maneuver	●	The lack of restricted airspace over some sections of the range complex imposes regulatory restrictions on firing and UAS operations. Operations in Controlled Firing Areas (CFAs), which currently exists, require units to cease fire unless specific weather minimums (visibility) are met. This restricts use of the small arms ranges and two major collective ranges. Also, uncontrolled aircraft operating in these areas shut down training. The lack of restricted airspace also impacts UAS operations due to the additional operational support requirements for UAS to fly outside of restricted airspace. JPARC EIS has been completed. Based on this, the Army has submitted proposals to the FAA for an increase in restricted airspace over Army training lands. These actions are expected to be complete in 2017. This increase will alleviate some of the existing restrictions on the collective ranges and UAS operations. Operations in the CFA can be mitigated with existing radar surveillance, however, the current system is outdated and will have to be replaced in the near future.
	Fire Support	●	Same as above.
	Intelligence	●	Same as above.
	Command Control	●	Same as above.
Infrastructure	Movement and Maneuver	●	A poor training area road infrastructure and trail network is an issue based on seasonal fluctuations (freeze/thaw cycles), which significantly degrades trail accessibility annually. Original trail construction (pre-calendar year 2000) methods did not produce suitable driving surfaces for the heavier modern fighting vehicles. Historically, road improvement and trail projects have been underfunded. This is an ongoing issue and road infrastructure and trail projects have been submitted to address this situation.
	Fire Support	●	Same as above.
	Sustainment	●	Same as above.
Range Support	Movement and Maneuver	●	Range Support has been significantly impacted by the recent Two-Star Headquarters Reductions. This will reduce personnel authorizations to 55 percent of the original 53 authorizations by FY2019 (29 positions remaining). This will continue to affect range support at Fort Wainwright with a reduction in availability hours of support and backlog of maintenance. USARAK was the only headquarters that had TSS, including range operations, considered in the number for reduction. Since TSS functions comprise almost 50 percent of the USARAK civilian staff, range operations was sacrificed to support other command functions. The loss has been mitigated by over hires and Borrowed Military Manpower (BMM) to the extent possible to meet baseline training requirements. A recent manpower analysis developed a range manpower model for USARPAC. This model, approved by the Army manpower analysis agency, establishes 120 requirements for range operations across USARAK. A buy back of 43 requirements has been approved by the Department of the Army, pending funding, effective in FY2019. This will return range operations strength across USARAK to 98 positions and restore FWA to its strength before the reductions.
	Fire Support	●	Same as above.
	Sustainment	●	Same as above.

Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

Fort Wainwright Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Small Arms Ranges	Movement and Maneuver	●	Several small arms ranges are reaching the end of their lifespan, additionally some ranges do not meet required Army standards. Currently, only one is programmed for modernization as a MILCON project in FY2023. Based on re-stationing decisions made by the Army in 2000, a significant number of ranges were built across USARAK at all locations. These ranges are now coming to the end of their programmed life cycle and need to be considered for refurbishment. The timetable for modernization must be maintained or there is a risk of equipment failure. Training requirements have to be met using workaround solutions on aging ranges. Modernization and re-vitalization projects are identified in the Range Complex Master Plan. Projects require support and funding in order to meet training throughput requirements. This is an ongoing effort.
	Sustainment	●	Same as above.
	Protection	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Movement and Maneuver	●	The lack of restricted airspace over some sections of the range complex imposes regulatory restrictions on firing and UAS operations. Operations in CFAs, which currently exist, require units to cease fire unless specific weather minimums (visibility) are met. This restricts use of the small arms ranges and two major collective ranges. Also, uncontrolled aircraft operating in these areas shut down training. The lack of restricted airspace also impacts UAS operations due to the additional operational support requirements for UAS to fly outside of restricted airspace. The JPARC EIS has been completed. Based on this the Army has submitted proposals to the FAA for an increase in restricted airspace over Army training lands. These actions are expected to be complete in 2017. This increase will alleviate some of the existing restrictions on the collective ranges and UAS operations. Operations in the CFA can be mitigated with existing radar surveillance, however, the current system is outdated and will have to be replaced in the near future.
	Fire Support	●	Same as above.
	Intelligence	●	Same as above.
Climate Impacts	Movement and Maneuver	●	Trend line shifts in weather patterns have presented heavier, flash rain events and more intense drought conditions. This has resulted in more rapid permafrost thaw, and increased thermokarsting. Together these conditions have created an environment more conducive to destructive wildfires which exposes soil and coupled with more intense rain events makes soil more susceptible to increased erosion. The increased potential for wildfires significantly restricts the types of ammunition that can be used on the range. Once a fire has started it also impacts directly on training. The resulting increase in soil erosion has rendered some areas impassable and restricted access to the training area. Wildfire mitigation efforts around impact area and ranges have been incorporated into long and short term range plans to help contain wildfire spread and to mitigate wildfire starts. More sophisticated fire weather prediction tools are incorporated into range usage and munitions use. Infrastructure projects to repair roads and access trails have been planned and submitted to DPW for Sustainment, Restoration and Modernization funding. This effort is ongoing.
	Fire Support	●	Same as above.
Land Use	Movement and Maneuver	●	Incompatible adjacent development (residential areas) off post have placed restrictions on time of day, time of year, and type military use/training events; this incompatible use reduces the available training opportunities for units. Implementation of the FWA ACUB Program helps to mitigate this impact. An updated ACUB plan is being staffed to continue efforts to mitigate for encroachment. This update is expected to be complete in 2017.
	Fire Support	●	Same as above.

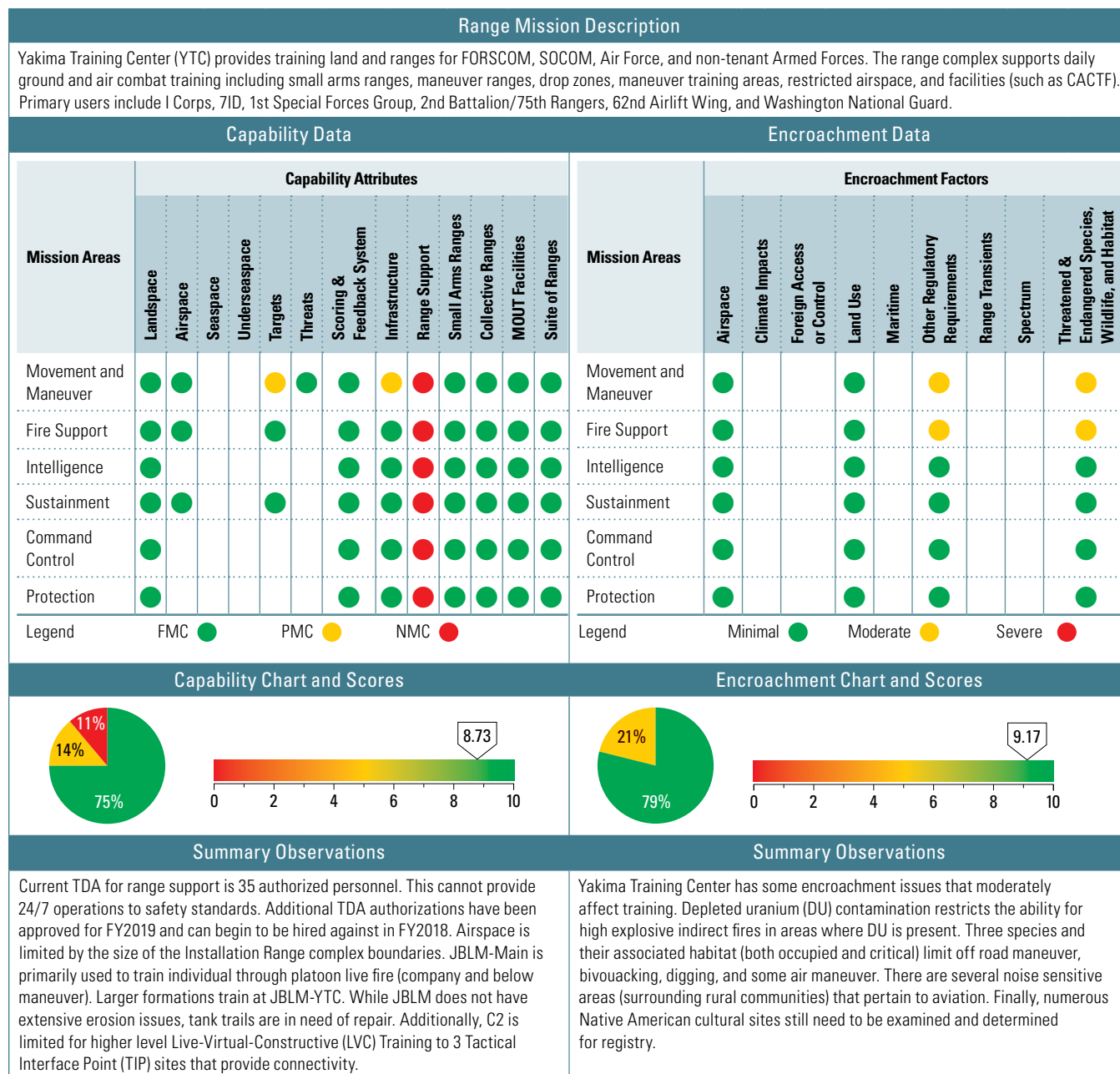
Fort Wainwright Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Other Regulatory Requirements	Movement and Maneuver	●	Archeology and wetlands are present over much of Fort Wainwright training lands and are generally exclusive of each other. Both of these areas require mitigation prior to use for training. This has a direct impact on the availability of land for training. Regulations for both archeology and wetlands limit digging in training lands and either require permitting to be done or excavations of sites in order to mitigate. This mitigation can be costly. This condition has existed throughout the history of the installation and will endure in the future. Training areas are prioritized by likelihood of use/development for training based on proximity to access, wetland presence and slope. Areas are proactively surveyed to identify regulatory restrictions. A mission specific wetlands permit is being developed to allow for fill related to training that incorporates mitigation requirements. This effort is expected to be completed in the spring 2018. Continued archaeological mitigation of sites and coordination with the Alaska SHPO is ongoing to ease limitations on ground disturbing activities.
	Fire Support	●	Same as above.
	Intelligence	●	Same as above.
Range Transients	Movement and Maneuver	●	Uncontrolled civilian aircraft operate over Army owned training lands outside restricted airspace, which interferes with aerial maneuver and movement training. Alaska has one of the largest populations of small aircraft general aviation in the world, therefore, this situation is expected to persist. The installation is seeking to expand restricted airspace through the FAA that will allow for administrative control of civilian aircraft over a greater area of Army controlled lands. This is expected to be completed in 2017.
	Fire Support	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Fire Support	●	The presence of various wildlife including bison, caribou, sandhill cranes, and golden eagles on or in close proximity to ranges and training areas requires operations to cease until the animals have cleared the area. Wildlife presence on the range has occurred throughout the history of the range complex. Memoranda of agreement and other operational procedures have been put in place to preclude harm to the animals, however training is still restricted. The Army has recently been informed that they own the large game animals, and are exploring authority to synthetically encourage large game species movement off ranges, as well as building flexibility into training exercises to de-conflict with sandhill cranes and golden eagles. This policy should be included into the next iteration of the INRMP in 2018.

Figure 3-9 Army Capability and Encroachment Assessment Detail (continued)

Yakima Training Center Assessment Details



Yakima Training Center Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	6.89	6.89	8.22	9.52	9.52	8.18	Encroachment Scores	8.90	8.90	9.02	9.15	9.15	9.70
Capabilities have generally improved at Yakima Training Center over the past several years. Infrastructure shortfalls have been addressed and resources are programmed in the out-years, although some repairs to tank trails are required. Recent manpower reductions have caused significant cuts in range operations starting in FY2012; however, additional authorizations on the FY2019 TDA will provide relief. Targetry will become a capability problem in the future if funds are not provided for rebuilds.							Part of the EIS analysis included impacts to Greater Sage Grouse (GSG). At the time, the GSG was a candidate species on the path to listing under the ESA and these management activities were identified in an effort to preclude the listing of this species. The ROD identified management activities that included restrictions of training by limiting hours and seasons available for Fire Support activities, no digging, no off-road maneuver, and no bivouacking in occupied habitat to offset possible impacts. The installation also identified potential future management activities to offset these impacts to training that included possible conservation easements on non-Army lands through the ACUB Initiative, habitat manipulation in some training areas to provide open maneuver outside of occupied habitat, and relocating training to other areas outside of occupied habitat. However, the USFWS determined that the listing of the species was not warranted in 2016 and the installation is currently developing an alternate management plan to re-visit the ROD mitigation strategies.						

Yakima Training Center Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Targets	Movement and Maneuver	●	Several qualification ranges require upgrade to targetry as the data boxes fill with water. This will begin to affect training as data boxes begin to fail. The remedy is to rebuild the targetry for those ranges; this will cost approximately \$600K per range, and the funds have been requested in RCMP and the training budget.
Infrastructure	Movement and Maneuver	●	Tank trails are in disrepair. Vehicles must navigate wide portions and potholes. Funding has been requested for tank trail repair.
Range Support	Movement and Maneuver	●	There is currently insufficient range support personnel to safely provide 24/7 coverage of the range complex. Training is not allowed while range support is closed, making certain long term training activities infeasible. JBLM-Main and JBLM-YTC are receiving a combined additional 67 authorizations in FY2019 which can be hired against beginning in FY2018.
	Fire Support	●	Same as above.
	Intelligence	●	Same as above.
	Sustainment	●	Same as above.
	Command Control	●	Same as above.
	Protection	●	Same as above.

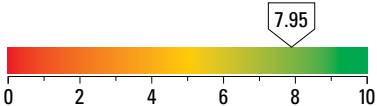
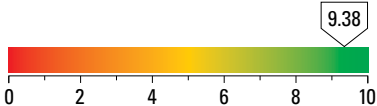
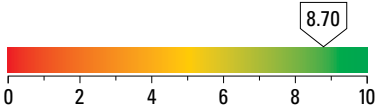
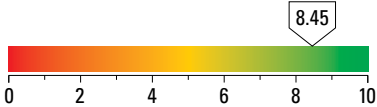
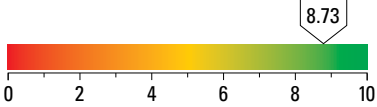
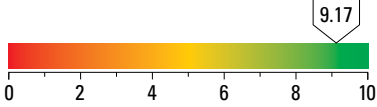
Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Other Regulatory Requirements	Movement and Maneuver	●	Numerous Native American Cultural sites have been found on YTC. No training occurs in known or suspected cultural sites. Remedies include researching sites to determine their cultural significance.
	Fire Support	●	DU was fired at YTC in the 1960s. The residue from this ammo creates hazards and restrictions on HE rounds within the boxes. This results in limitations to HE rounds for indirect fire weapons to outside of those boxes and the closure of R14. YTC is working with the Nuclear Regulatory Commission to license the areas so that clean up can begin.
Threatened & Endangered Species, Wildlife, and Habitat	Movement and Maneuver	●	Three recently listed species for protection occupy critical habitat within the range complex, limiting training events in those areas. Impacts to training are not finalized but are expected to include no digging, no off-road maneuver, and no bivouacking in occupied or critical habitat. Remedies include ACUB, de-forestation of some training areas to provide open maneuver outside of occupied and critical habitat, and relocating training to other areas outside of critical or occupied habitat.
	Fire Support	●	Three recently listed species for protection occupy critical habitat within the range complex, limiting training events in those areas. Impacts to training are not finalized, but are expected to include limited hours and seasons available for Fire Support activities. Remedies include utilizing areas outside of protection areas as necessary.

Table 3-3 Army Range Capability and Encroachment Assessment Comparison

Range Name	Capability Score	Encroachment Score
Fort Benning	8.18	9.06
Fort Bliss	9.58	8.88
Fort Bragg	7.92	8.45
Fort Campbell	9.40	9.69
Fort Carson	8.80	9.00
Fort Drum	9.76	10.00
Hawaii	8.08	6.74
Fort Hood	9.84	9.42
Fort Irwin	8.92	9.72
Joint Base Lewis-McChord	8.80	8.96
Fort Polk	8.81	9.64
Fort Riley	9.83	10.00

Table 3-3 Army Range Capability and Encroachment Assessment Comparison (continued)

Range Name	Capability Score	Encroachment Score
Fort Stewart		
Fort Wainwright		
Yakima Training Center		

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3.2.2 Marine Corps Range Assessments

Table 3-4 Marine Corps Capability Assessment Data Summary

Range	NMC	PMC	FMC	Capability Scores
MCAS Beaufort/Townsend Bombing Range	0	6	8	7.86
MCLB Barstow	0	6	3	6.67
MCMWTC Bridgeport	0	23	0	5.00
MCIPAC-MCB Butler	18	10	6	3.24
MCAS Cherry Point	0	9	10	7.63
MCB Hawaii	11	11	2	3.13
MCB Camp Lejeune	3	19	21	7.09
MCAS Miramar (Camp Elliott)	0	6	4	7.00
MCB Camp Pendleton	4	18	8	5.67
MCB Quantico	0	17	4	5.95
MCAGCC Twentynine Palms	1	4	30	9.14
MCAS Yuma/Bob Stump	0	18	12	7.00
HQ USMC	37	147	108	6.22

Table 3-5 Marine Corps Encroachment Assessment Data Summary

Range	Severe	Moderate	Minimal	Encroachment Scores
MCAS Beaufort/Townsend Bombing Range	0	0	16	10.00
MCLB Barstow	0	4	2	6.67
MCMWTC Bridgeport	0	21	3	5.63
MCIPAC-MCB Butler	11	7	0	1.94
MCAS Cherry Point	0	6	12	8.33
MCB Hawaii	6	4	3	3.85
MCB Camp Lejeune	0	18	14	7.19
MCAS Miramar (Camp Elliott)	0	4	10	8.57
MCB Camp Pendleton	4	14	3	4.76
MCB Quantico	0	7	7	7.50
MCAGCC Twentynine Palms	1	10	21	8.13
MCAS Yuma/Bob Stump	5	10	3	4.44
HQ USMC	27	105	94	6.48

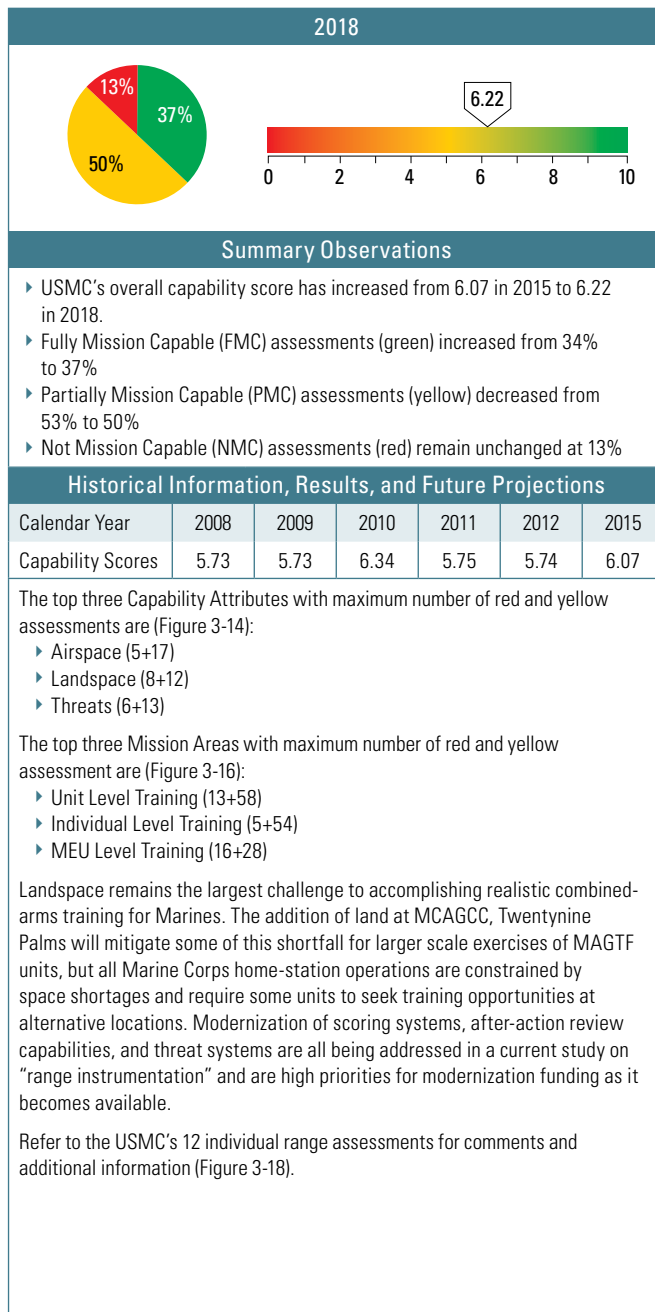
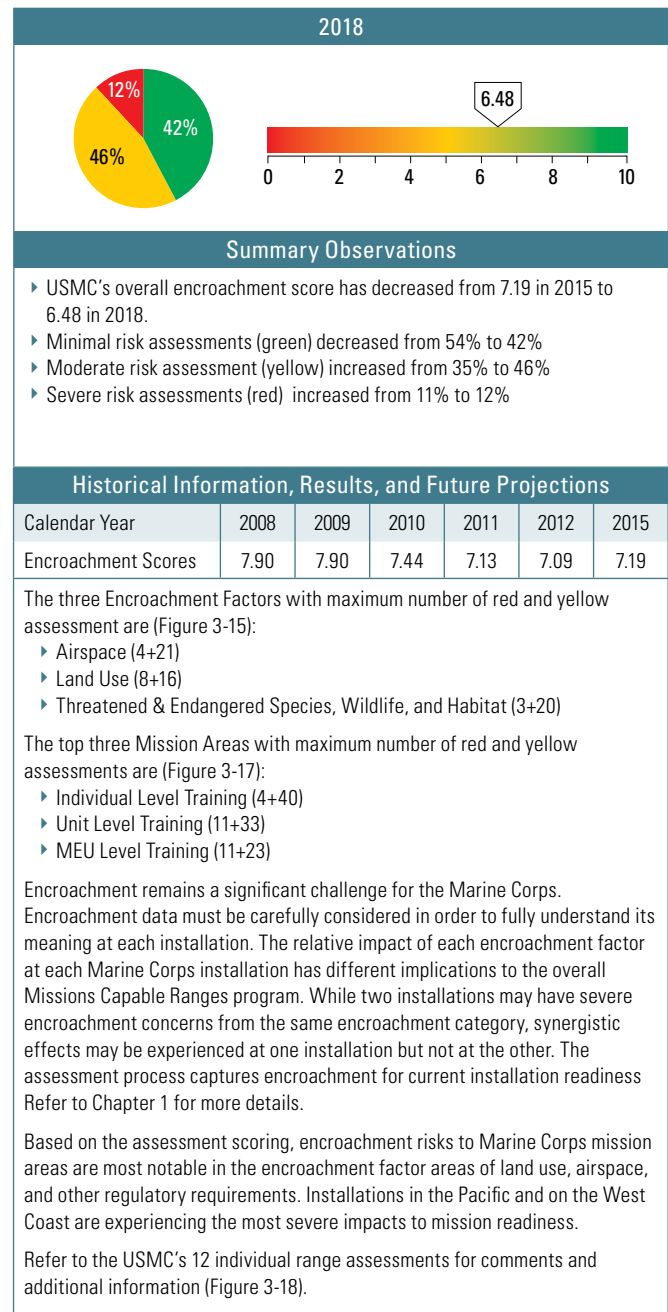
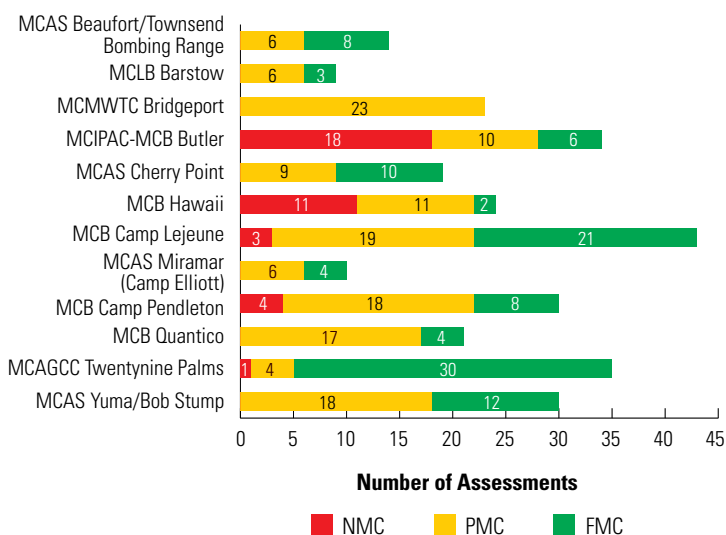
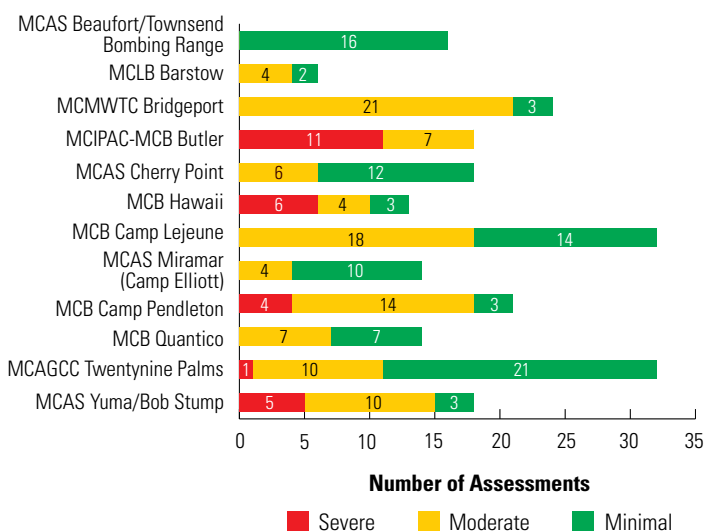
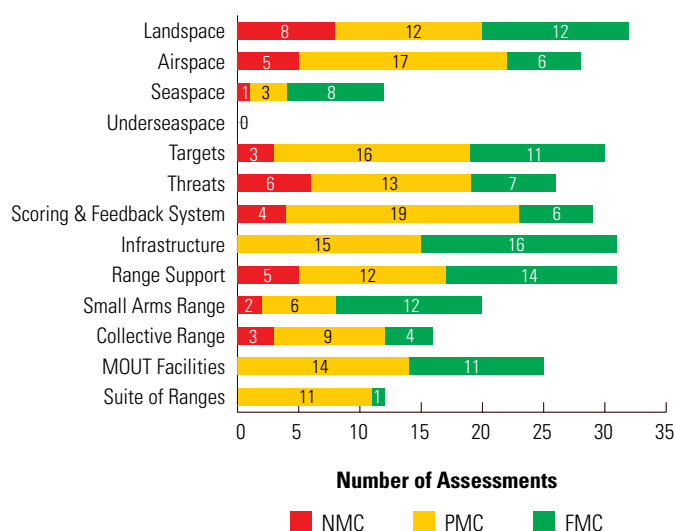
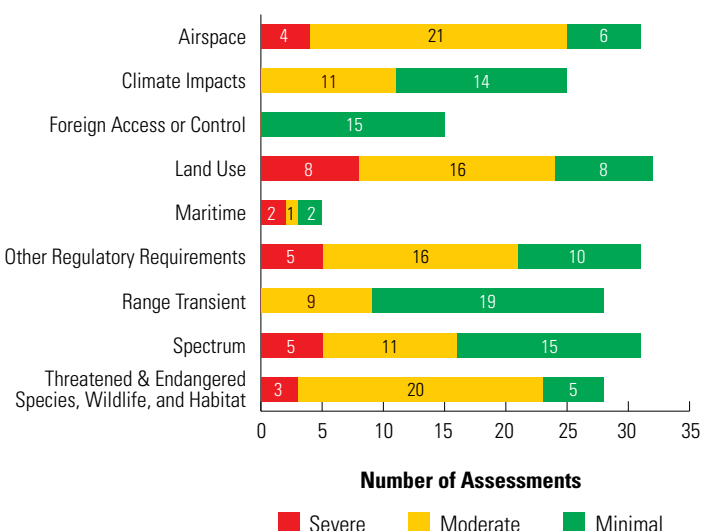
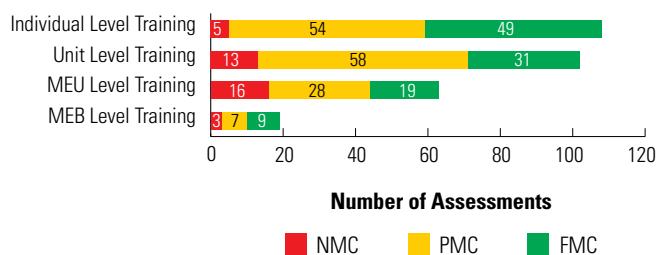
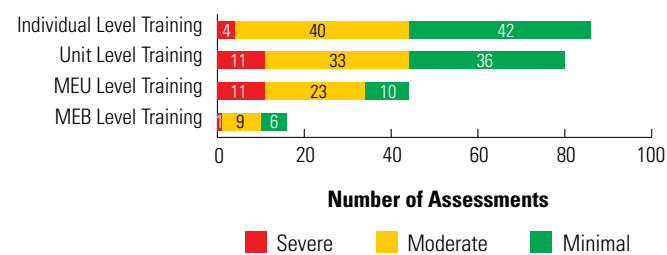
Figure 3-10 Marine Corps Capability Chart and Scores**Figure 3-11** Marine Corps Encroachment Chart and Scores

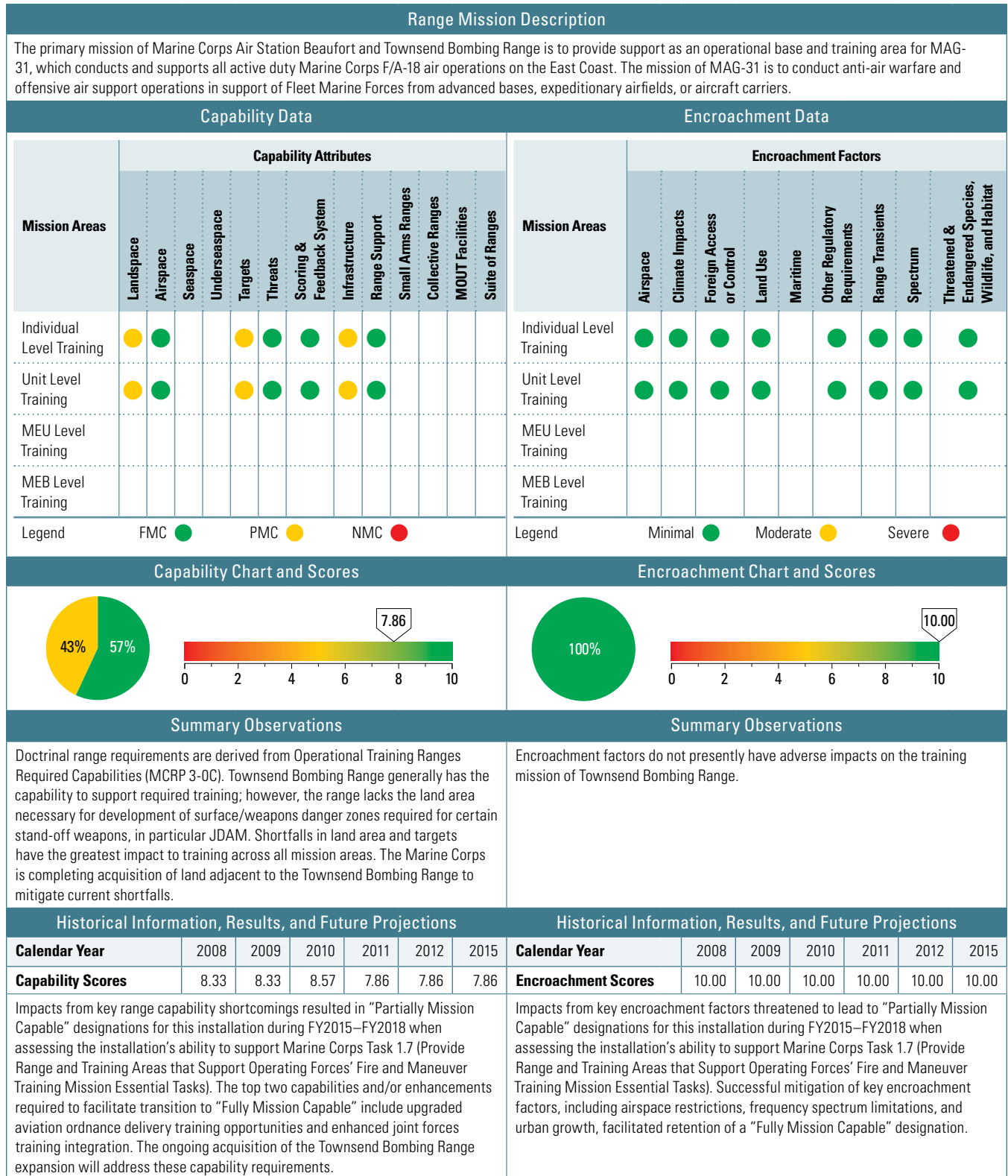
Figure 3-12 Marine Corps Capability Assessments by Range**Figure 3-13** Marine Corps Encroachment Assessments by Range**Figure 3-14** Marine Corps Capability Assessment by Attributes**Figure 3-15** Marine Corps Encroachment Assessment by Factors**Figure 3-16** Marine Corps Capability Assessment by Mission Areas**Figure 3-17** Marine Corps Encroachment Assessment by Mission Areas

Of the 14 ranges identified in the Marine Corps' range inventory in Appendix A, two are not assessed. Marine Corps Logistics Base (MCLB) Albany and Marine Corps Recruit Depot (MCRD) Parris Island have no ranges other than small-arms ranges used for the limited purpose of weapons qualification training. Due to their limited nature, the Marine Corps does not intend to formally evaluate these ranges unless the mission changes or some encroachment factor threatens their ability to function.

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Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail

Marine Corps Air Station (MCAS) Beaufort/Townsend Bombing Range Assessment Details



MCAS Beaufort/Townsend Bombing Range Detailed Comments

Capability Observations

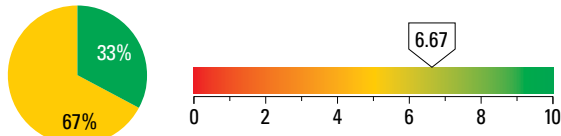
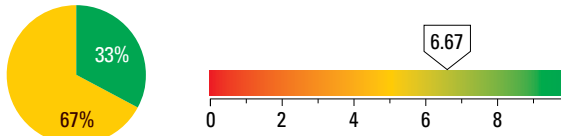
Attributes	Assigned Training Mission	Score	Comments
Landspace	Individual Level Training	●	The Marine Corps will complete land acquisition in 2017 and complete construction of six new target areas/ranges at TBR to enable fighter aircraft to deliver inert LGB and JDAM weapons at tactical employment speeds and altitudes.
	Unit Level Training	●	Same as above.
Targets	Individual Level Training	●	The range lacks mobile targets which decreases training realism. The Marine Corps Range Modernization/Transformation program is addressing shortfalls as resources become available.
	Unit Level Training	●	Same as above.
Infrastructure	Individual Level Training	●	Townsend Bombing Range expansion will address constraints on training and includes the addition of a 28 person workforce supporting range control and facilities maintenance. Communications gaps have been closed by the Marine Corps Enterprise Network and Base Telephone Infrastructure installment upgrades to support USMC operations. ELMR and LARCS systems will be installed following infrastructure upgrades completed with MILCON funding by December 2019.
	Unit Level Training	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
No comments.			

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

MCLB Barstow Assessment Details

Range Mission Description																										
Barstow provides range capabilities to support training of Marines in individual unit training, annual qualification, distributive MAGTF training and other essential tasks of modern expeditionary warfare, focused on training requirements of units assigned to the installation and visiting active duty or reserve units.																										
Capability Data													Encroachment Data													
Capability Attributes													Encroachment Factors													
Mission Areas		Landscape	Airspace	Seaspace	Underseaspace	Targets	Threats	Scoring & Feedback System	Infrastructure	Range Support	Small Arms Ranges	Collective Ranges	MOUT Facilities	Suite of Ranges	Mission Areas		Airspace	Climate Impacts	Foreign Access or Control	Land Use	Maritime	Other Regulatory Requirements	Range Transients	Spectrum	Threatened & Endangered Species, Wildlife, and Habitat	
Individual Level Training		●	●			●			●	●	●	●	●	●	Individual Level Training		●			●		●	●	●	●	●
Unit Level Training															Unit Level Training											
MEU Level Training															MEU Level Training											
MEB Level Training															MEB Level Training											
Legend		FMC ●		PMC ●		NMC ●									Legend		Minimal ●		Moderate ●		Severe ●					
Capability Chart and Scores													Encroachment Chart and Scores													
																										
Summary Observations													Summary Observations													
Doctrinal range requirements are derived from Operational Training Ranges Required Capabilities (MCRP 3-OC). Barstow’s Range Concept Management Plan (RCMP) is in draft form and provides data for this assessment. The range area is comprised of three small arms ranges and open space that encompasses the surface danger zones for each range when live fire is occurring. When ranges are not active the range area is also available for limited non-live fire training. The ranges and training areas at Barstow are utilized to support training and readiness of Marines stationed at MCLB Barstow. As a home station to a small number of Marines, Barstow’s ranges and training areas are also utilized by Marine Corps Police Department, Rail Operations Group, Units from 1 Marine Expeditionary Force, Special Operations, Marine Corps and Army Reserve Units stationed in the region, and local and federal law enforcement agencies.													Encroachment impacts are moderate for individual level training. There is no restricted or special use air space affiliated with Barstow range, rotary and tilt rotor aircraft drop out of general airspace and coordinate with Daggett Airfield for safety purposes. Wind energy development and land use affiliated with utility corridors require ongoing monitoring and coordination. Critical habitat and desert tortoise have a minimal impact on range operations. Barstow is in the final stages of an Environmental Assessment that will baseline operations and provide a platform for management plans to minimize future encroachment.													
Historical Information, Results, and Future Projections													Historical Information, Results, and Future Projections													
Calendar Year		2008	2009	2010	2011	2012	2015	Calendar Year		2008	2009	2010	2011	2012	2015											
Capability Scores		N/A	N/A	N/A	N/A	N/A	N/A	Encroachment Scores		N/A	N/A	N/A	N/A	N/A	N/A											
This is the first year Barstow is being scored in the Sustainable Ranges Report. Historically, units stationed on Barstow and visiting units executed annual training on and around the installation. The ranges have been operational since the 1950’s and have included tactical training, maneuver, and live fire training. Barstow in the final stages of completing an Environmental Assessment to support range operations and maintenance activities. Additionally, a RCMP for Barstow is being developed through MCIWEST Regional Range Complex Management. The RCMP will enable further development of training areas at Barstow that will address regional training gaps.													This is the first year Barstow is being scored in the Sustainable Ranges Report. The ranges and training areas at Barstow are utilized to support training and readiness of Marines stationed at MCLB Barstow. As a home station to a small number of Marines, Barstow’s ranges and training areas are also utilized by Marine Corps Police Department, Rail Operations Group, Units from 1 Marine Expeditionary Force, Special Operations, Marine Corps and Army Reserve Unit stations in the region, and local and federal law enforcement agencies.													

MCLB Barstow Detailed Comments

Capability Observations

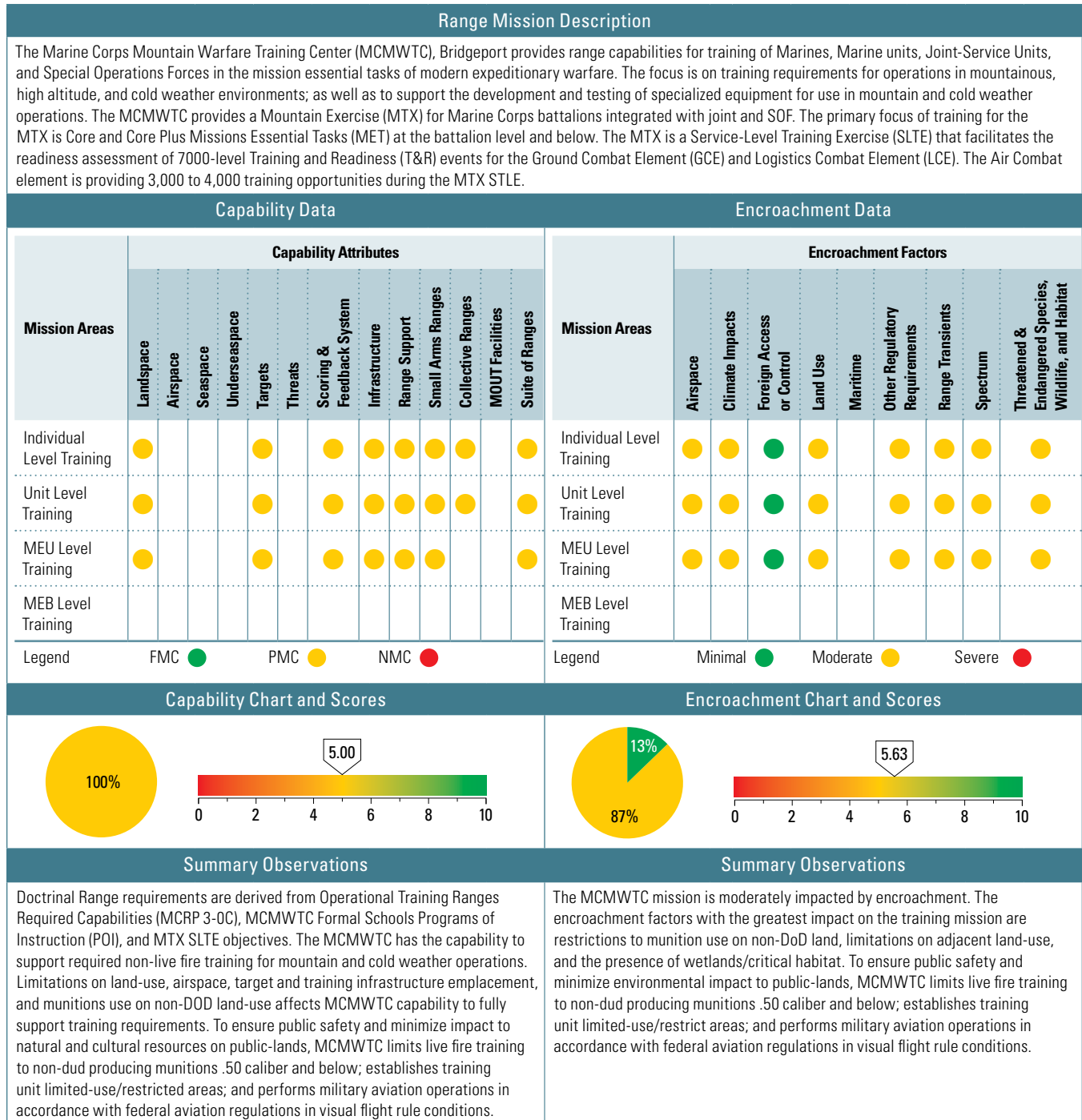
Attributes	Assigned Training Mission	Score	Comments
Airspace	Individual Level Training	●	There is no air control capability (Physical and RFMSS); terminal control is managed by the training unit using UHF. Currently, units requesting air missions (rotor only) have terminal guidance/control via ground communications.
Infrastructure	Individual Level Training	●	MCLB has only two billeting facilities and an austere training area. Infrastructure reset actions are taking precedence at this time so there is no solution to this issue.
Range Support	Individual Level Training	●	There is only a single GS-12 range control officer, making it problematic to support multiple events on the ranges and training areas. There is no known solution.
Collective Ranges	Individual Level Training	●	The KD range, pistol range, and shotgun range largely used by the Marine Corps police department; this prevents dynamic training on the base. The proposed solution is to expand the task to include live fire and maneuver.
MOUT Facilities	Individual Level Training	●	The lack of MOUT facilities can be overcome by temporary facilities, for example, the SESAMS training facilities utilized by the Marine Corps police department.
Suite of Ranges	Individual Level Training	●	The range area is comprised of three small arms ranges and open space that encompasses the surface danger zones for each range when live-fire is occurring. When ranges are not active the range area is also available for limited non-live fire training. The RCMP has facilities, grading, and trail development to increase training infrastructure.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Individual Level Training	●	General aviation traffic frequently fly over or in close proximity to the firing ranges which requires look outs in order to initiate cease fire during live-fire training. These incursions sometimes require the expenditure of additional ammunition for interrupted small arms qualification strings of fire. Continued coordination by installation and regional personnel will be required to reduce incursions.
Land Use	Individual Level Training	●	Utility corridors through the range complex create hazardous conditions to personnel and/or aircraft operations. Existing utility corridors are routinely inspected and are also evaluated for additional capacity and/or more utility infrastructure by utility companies. Ensuring land use planning for future utility corridors is addressed in the Installations Range Complex Management Plan (currently under development). The Range Complex Management Plan will allow for installation range and land use planning personnel to identify areas where these corridors can be cited to avoid encroachment onto the range complex.
Other Regulatory Requirements	Individual Level Training	●	Desert tortoise critical habitat covers a sizeable portion of the range area along the southern boundary. The area is usable but needs to be managed and implemented through an updated INRMP in order to open these areas to appropriate levels of training and range sustainment activities. Programmatic Biological Opinion for training and range sustainment activities has been issued by USFWS but not fully implemented by MCLBB yet.
Threatened & Endangered Species, Wildlife, and Habitat	Individual Level Training	●	Same as above.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

Marine Corps Mountain Warfare Training Center (MCMWTC) Bridgeport Assessment Details



Marine Corps Mountain Warfare Training Center (MCMWTC) Bridgeport Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	5.00	5.00	5.00	5.00	5.00	5.00	Encroachment Scores	5.00	5.00	5.00	5.00	5.00	5.00
The MCMWTC capabilities assessment remains consistent with previous year assessments. The ongoing EA in accordance with the NEPA may improve the MCMWTC training capabilities. The thorough analysis, evaluation, and decision regarding ongoing training activities may allow for continued mission accomplishment. The publication of the Training Activity EA may allow for increased training capabilities based on established mitigations to reduced natural and cultural resources impacts while ensuring public safety in the national forest. Publication of the Training Activity EA and decisions regarding cultural resource sites are planned for FY2018.							The MCMWTC encroachment assessment remains consistent with previous year assessments. The ongoing Training Activity EA may improve the MCMWTC encroachment assessments. The thorough analysis, evaluation, and decision regarding ongoing training activities may allow for continued mission accomplishment. The publication of the Training Activity EA may allow for increased training capabilities based on established mitigations to reduced natural and cultural resources impacts, while ensuring public safety in the national forest. Publication of the Training Activity EA and decisions regarding cultural resource sites is planned for FY2018.						

MCMWTC Bridgeport Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Individual Level Training	●	The amount of training land is sufficient to support required training; however, a majority of the RTA is located on public-land owned by the USDA and managed by the USFS. Activities on public-land are limited due to public safety, natural/cultural resource conservation, and an ongoing EA evaluation. Limitations on land-use affect landspace capabilities to fully support training unit activities. Publication/decision regarding the ongoing EA will allow MCMWTC to associate training activities to training sites based on training activity design features. Ongoing EA completion is anticipated for FY2018.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Targets	Individual Level Training	●	A majority of MCMWTC live fire training ranges are located on public-land. MCMWTC is not permitted to establish permanent/fixed target systems. The remote mountainous terrain, lack of all-season roads and/or vehicle access to target emplacement areas limits MCMWTC target support to temporary man-portable target systems. Temporary and man-portable target systems limit the type and size of the target systems available for individual/unit-level live fire, and to simulate indirect-fire/close air support training. The publication/decision regarding the ongoing EA will allow MCMWTC to submit supplemental EA requests for constructing access roads to support larger target systems. Ongoing EA completion is anticipated for FY2018.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	MEU-Level training is limited to targets for simulated/non-live fire training for indirect fire and/or close air support. Targets for these activities are limited to road accessible areas due to the size/foot print requirement for these training objectives. Publication/decision regarding the ongoing EA will allow MCMWTC to submit supplemental EA requests for constructing access roads to support larger target systems. Ongoing EA completion is anticipated for FY2018.
Scoring & Feedback System	Individual Level Training	●	A majority of MCMWTC RTA is located on public-land. MCMWTC is not permitted to establish permanent/fixed scoring and feedback systems. The lack of all-season roads and/or vehicle access limits the ability to establish temporary trailers and/or transceiver/receiver stations for scoring and feedback systems. MCMWTC relies on instructor/controllers to evaluate and score training activities in lieu of a scoring and feedback system. MCMWTC is working with the program manager for the Instrumented Tactical Engagement Simulation System (ITESS) to support scoring and feedback of the MTX SLTE. A company-level training exercise test will be evaluated by ITESS-II during the summer of 2017. This will provide valuable information regarding the feasibility of employing the ITESS for future SLTE in the mountains.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Infrastructure	Individual Level Training	●	MCMWTC is responsible for road maintenance in the MCMWTC training areas. MCMWTC is generally not authorized to develop range or training area infrastructure. Special Use Permits with the USFS restrict the installation of permanent training equipment/structures and construction/maintenance of road systems. MCMWTC is limited to the current/permitted roads/infrastructure per the special use permits issued by the USFS. Publication/decision regarding the ongoing EA will allow MCMWTC to submit supplemental EA requests for installation of equipment/structures as well as support construction/maintenance of access roads. Ongoing EA completion is anticipated for FY2018.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)**MCMWTC Bridgeport Detailed Comments****Capability Observations**

Attributes	Assigned Training Mission	Score	Comments
Range Support	Individual Level Training	●	Current communication infrastructure for ground and air communications does not support ninety percent coverage of the MCMWTC RTA. Lack of communication limits training activities with respect to casualty evacuation/emergency response coordination. MCMWTC Enterprise Land-Mobile Radio (ELMR) MILCON project is planned to begin FY2018. The ELMR project is projected to resolve ground communication issues. Once the ELMR project is complete, the communication section plans to procure LARC equipment for integration/installation into the ELMR repeater towers. Funding for the LARC(s) is not approved and/or allocated.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Small Arms Ranges	Individual Level Training	●	MCMWTC small-arms ranges are limited to non-dud producing munitions .50 caliber and below in size. This limitation is due to live-fire activities on public-land and the ongoing EA. MCMWTC small-arms ranges cannot support all weapons organic to an infantry battalion. Publication/decision regarding the ongoing EA will allow MCMWTC to submit supplemental EA requests for increasing type of munitions employed at MCMWTC.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Collective Ranges	Individual Level Training	●	MCMWTC individual level collective ranges are limited to non-dud producing munitions .50 caliber and below in size. This limitation is due to live fire activities on public-land and the ongoing EA. MCMWTC small arms ranges cannot support all weapons organic to an infantry battalion thus restricting the individual/collective T&R training standards. The publication/decision regarding the ongoing EA will allow MCMWTC to submit supplemental EA requests for increasing type of munitions employed at MCMWTC.
	Unit Level Training	●	MCMWTC collective ranges are limited in scope, size, and activity due to use of public-land. Live fire unit training is limited to squad/platoon static live fire with limited fire and movement/maneuver training. The publication/decision regarding the ongoing EA will allow MCMWTC to submit supplemental EA requests for increasing size and type of ranges at MCMWTC.
Suite of Ranges	Individual Level Training	●	MCMWTC RTA is sufficient to support required training for mountain/cold weather training; however, a majority of RTA is located on public-land owned by the USDA and managed by the USFS. Activities on public-land is limited due to public safety, natural/cultural resource conservation, and an ongoing EA evaluation. Limitations based on special-use-permits constrains a majority of training activities to non-live events. The focus on non-live training events allows for more flexibility with respect to coordination of training activities within the national forest. The publication/decision regarding the ongoing EA will allow MCMWTC to associate training activities to training site venues based on training activity design features. Ongoing EA completion is anticipated for FY2018.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Individual Level Training	●	MCMWTC has no assigned SUA. Military aviation operations are executed in accordance with federal aviation regulations in VFR conditions. MCMWTC began the proposal process to establish a MOA in FY2016. The proposed MOA is to support increased flight activities associated with the MTX SLTE. Funding for the required EA of the proposed MOA was authorized in FY2017. Completion of the airspace EA is planned for FY2019.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Climate Impacts	Individual Level Training	●	During 2013- 2016, MCMWTC observed drought conditions and below-average snowfall. The below-average snowfall resulted in a limited area available to complete cold-weather training. The drought conditions increased the wildfire hazard. In 2017, MCMWTC experienced a historic a snowfall season resulting in completion of cold-weather training requirements.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.

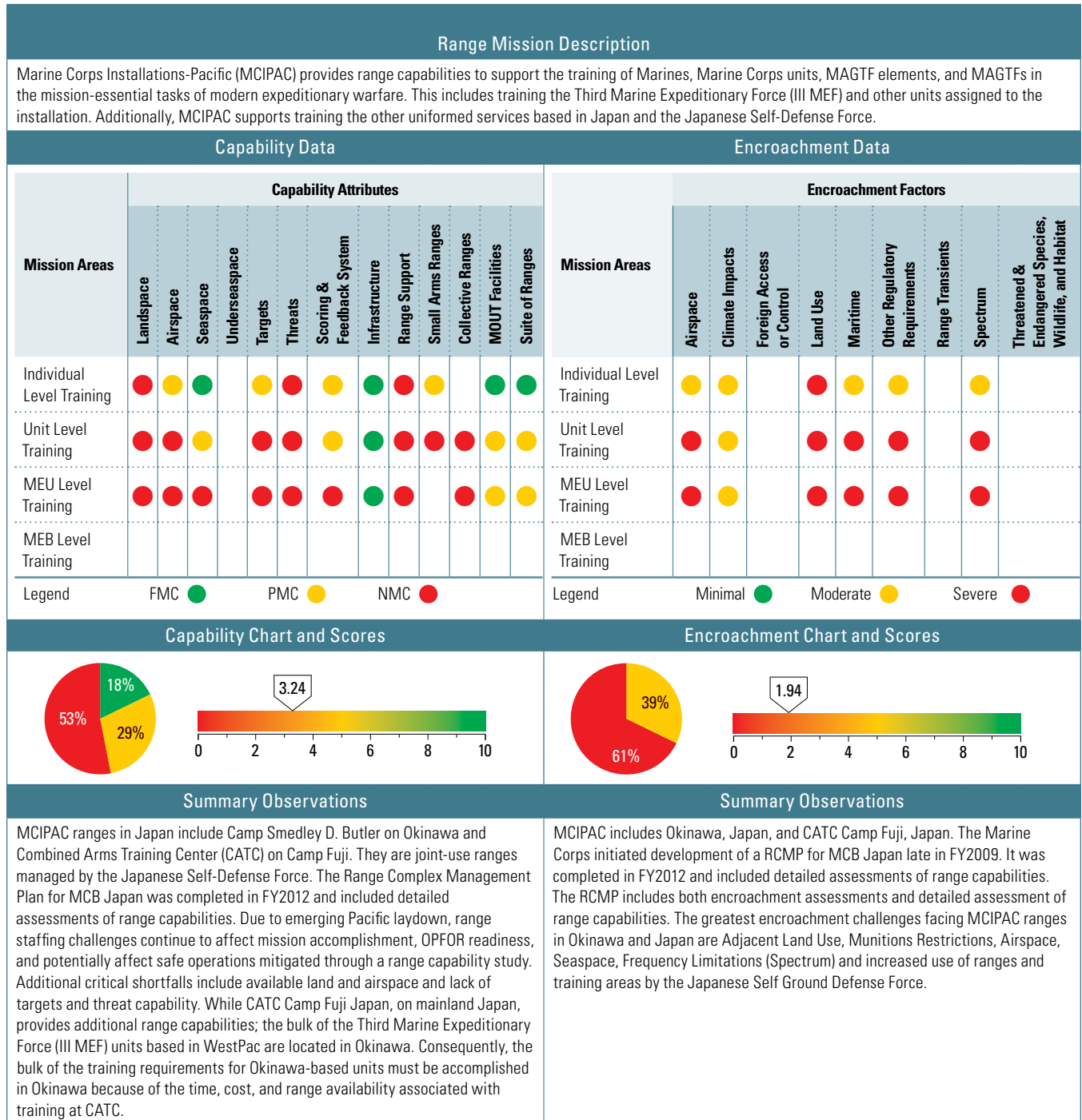
MCMWTC Bridgeport Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Land Use	Individual Level Training	●	MCMWTC is situated on land owned by the USDA and managed by the USFS. The entire range complex is a co-use/joint-use area, contains environmentally sensitive resources, and is subject to permit-based restrictions on land use for military training. Some adjacent lands are designated as wilderness pursuant to the Wilderness Act. These lands are generally not available for training and the designation may create public expectations about appropriate noise emanating from MCMWTC training activities into wilderness areas. In addition, Congress designated a portion of MCMWTC as a National Winter Recreational Area for snowmobile use by the public. Publication/decision regarding the ongoing EA will establish environmental mitigations that may allow for additional training activities. Ongoing EA completion is anticipated for FY2018. Publication of the EA will allow MCMWTC to submit supplemental EA(s) for additional land training activity permits.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Other Regulatory Requirements	Individual Level Training	●	MCMWTC is situated on land owned by the USDA and managed by the USFS. The MCMWTC training area contains wetlands and cultural resources undergoing eligibility evaluation by the USMC and USFS. The live fire ranges associated with MCMWTC are overlay national forest that is open to the public. All activities performed by MCMWTC are based on the stipulations established in the special-use permits issued by the USFS. Cultural sites and wetlands presently constrain ground movement, maneuver training, road maintenance/construction, and landing zone availability. Munitions are restricted to non-dud producing rounds .50 caliber and below. Publication/decision regarding the ongoing EA will establish environmental mitigations that may allow for additional training activities in vicinity of wetlands. The EA is anticipated to be completed in FY2018. Publication of the EA will allow MCMWTC to submit supplemental EA(s) for additional land training activity permits. MCMWTC, in conjunction with the USFS, submitted a request for eligibility review of cultural resource sites evaluated as part of the ongoing EA for the RTA to the California and Nevada State Historic Preservation Offices (SHPO). California and Nevada SHPO decisions regarding cultural resource site eligibility and approval of proposed activity mitigations is planned for FY2018.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Range Transients	Individual Level Training	●	MCMWTC training activities occur on public lands managed by the USFS. MCMWTC is not authorized to restrict public activities associated with the national forest. Public activities within the national forest are authorized and typically unannounced. The presence of the public in the national forest limits USMC training activities. To ensure public safety, USMC limits/ceases training when the public is present in the vicinity of training activities. MCMWTC performs public engagement of public-land users to ensure safety and mitigate impacts to training activities. MCMWTC plans for use of alternate training ranges/sites when the public is observed occupying the proposed training sites.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Spectrum	Individual Level Training	●	Current communication infrastructure for ground and air communications does not support ninety percent coverage of the MCMWTC RTA. To increase ground and air communication coverage, MCMWTC is required to construct additional radio communication infrastructure in the national forest. MCMWTC must receive concurrence from the USFS to construct permanent structures on public land. Lack of communications limits training activities with respect to casualty evacuation/emergency response coordination. To resolve the lack of ground communication coverage, MCMWTC will construct five ELMR communication towers. MCMWTC completed the required EA for the proposed ELMR MILCON project and received approval from the USFS to proceed with construction in FY2018. Once the ELMR project is complete, the communication section plans to procure LARC equipment for integration/installation into the ELMR repeater towers. Funding for the LARC(s) is not approved and/or allocated.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Individual Level Training	●	Presence of threatened/endangered, sensitive, and candidate species seasonally restricts use of some areas of national forest. The special-use-permits issued by the USFS contains stipulations/limitations with respect to the threatened/endangered/sensitive/candidate critical habitats/refugees/activity centers. The publication/decision regarding the ongoing EA will establish environmental mitigations to allow for additional training activities in proximity to the habitats associated with threatened/endangered/sensitive/candidate species. Ongoing EA completion is anticipated for FY2018.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

Marine Corps Installations Pacific (MCIPAC)-MCB Butler Assessment Details



Marine Corps Installations Pacific (MCIPAC)-MCB Butler Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	N/A	N/A	N/A	3.79	3.50	3.50	Encroachment Scores	N/A	N/A	N/A	2.08	2.08	2.08
Impacts from key range capability shortcomings resulted in “Partially Mission Capable” designations for this installation in 2015 when assessing the installation’s ability to support Marine Corps Task 1.7 (Provide Range and Training Areas that Support Operating Forces’ Fire and Maneuver Training METs). The top three capabilities and/or enhancements required to facilitate transition to “Fully Mission Capable” include inadequate or non-existent Tables of Organization (T/O), an ineffective Fleet Assist Program (FAP), continuing permanent personnel vacancies, enhanced/scored ground combat element direct and indirect fire ranges, MAGTF combined arms live-fire and maneuver training capability, and scored aviation ranges (e.g., RW/FW).							Impacts from key encroachment factors resulted in “Partially Mission Capable” designations for this installation in 2011, 2012 and 2015 when assessing the installation’s ability to support Marine Corps Task 1.7 (Provide Range and Training Areas that Support Operating Forces Fire and Maneuver Training METs). Successful mitigation of key encroachment factors include airspace restrictions, adjacent land use / urban growth, munitions restrictions, seaspace restrictions, and frequency (spectrum) restrictions are required to facilitate transition to a “Fully Mission Capable” designation.						

MCIPAC-MCB Butler Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Individual Level Training	●	Effective training is possible on Okinawa; however, it will take imagination, creativity, and a continuously-aggressive outreach program to comply with the physical limitations of being located on a small island. The MCIPAC-MCB Camp Butler training facilities include the CTA, NTA, and ISTF. Public roads trisect and surround all three training areas. The only two impact areas occupy a significant portion of the south and north CTA. Two main sections of the maneuver area (approximately 12.5 km x 6 km (NTA) and 7.5 km x 3 km (CTA)) are heavily vegetated terrain full of ravines, which restricts mobility. This small area limits the types of training that can be conducted and the types of weapons that can be fired. Conversely, all weapons systems organic to the MEU can be fired within the CTA, with limitations. For example, guided munitions are excluded due to environmental limitations and political agreements on Okinawa. .50 caliber machine guns firing is restricted to two ranges on the island; at both, gunners have to place the guns in restraining devices, which prevents them from shifting fires. No aviation weapons can be fired on the island. There is a single miniature TERF route, much of which is over water. The size of the land area restricts ground and aviation training, which diminishes realism. The Defense Policy Review Initiative (DPRI) is a U.S. Government/GoJ agreement signed at the Secretary of State/Secretary of Defense level that reduces the impact and scope of U.S. Marine training on Okinawa. Any expansion of training space or capability will need robust support from the State and DoD level through the U.S./GoJ Joint Committee.
	Unit Level Training	●	Same as above, with exacerbated limitations.
	MEU Level Training	●	Same as above, with exacerbated limitations.
Airspace	Individual Level Training	●	The dimensions of the SUA are limited over the training areas, especially vertically. Ceilings vary from 1,000 feet MSL to 3,000 feet MSL in the restricted SUA. Some of the instrument approaches into Kadena Air Base overlay the restricted SUA. Additionally, the relatively low ceilings for this SUA are inadequate to support most individual weapons firing. RW aircrew are prohibited from firing weapons on the island. Expanding this SUA both horizontally and vertically is being explored with US Marine Corps and the Japanese Civil Aeronautics Bureau.
	Unit Level Training	●	With restricted SUA over CTA capped at either 1,000 feet or 3,000 feet MSL, mortars must fire at a minimum charge to preclude exiting the airspace. FW aircraft are prohibited from flying in the SUA, which means no training operations are supported within the CTA. The limitations imposed on mortar fires constrain combined-arms fires to platoon level. FW aircraft cannot operate within the CTA to support ground training, but CAS is available at nearby USAF ranges just off Okinawa. Expanding this SUA vertically is being explored with US Marine Corps and the Japanese Civil Aeronautics Bureau.
	MEU Level Training	●	Same as above, with exacerbated limitations.
Seaspace	Unit Level Training	●	Per agreement with the GoJ, there are several water surface areas available for training 120 days per year. The small training beach areas (Kin Green, Kin Blue and Kushi Crossing) provide access to the sea and land, but traveling from them requires the use of public roads. Available beaches are not contiguous with the available training space within the CTA, NTA or at CATC, Camp Fuji. No beach training areas currently exist on ISTF. The limited beach areas for landings preclude conducting large-scale amphibious assaults or raids. Transitioning from the beach to the training areas over public roads reduces the realism of and segments training. The DPRI is a U.S. Government/GoJ agreement signed at the Secretary of State/Secretary of Defense level which agrees to reduce the impact and scope of U.S. Marine training on Okinawa. Any expansion of training space or capability will need robust support from State/ SecDef level through the U.S./GoJ Joint Committee.
	MEU Level Training	●	Same as above.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

MCIPAC-MCB Butler Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Targets	Individual Level Training	●	Forty-six vehicle type steel targets have been recently added across three ranges within the CTA as part of the operational range clearance program. The lack of adequate targets makes it difficult to improve weapons skills. Automated targets are only available on the sniper range.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Threats	Individual Level Training	●	There are no Electronic Warfare (EW) threats for aviation on Okinawa or mainland Japan. Recent advancements in communication technology and other electronic platforms have not received host nation approval. There is no standing OPFOR to support ground training. Aviators permanently assigned to Okinawa-based squadrons are unable to familiarize themselves with EW threat systems or practice tactics against them. For training exercises, ground OpFor normally comes from a sister unit, which is not trained to execute threat tactics and provides a less effective training experience.
	Unit Level Training	●	Same as above. Shortfalls in threat capabilities have most significant impact on more complex training events.
	MEU Level Training	●	Same as above.
Scoring & Feedback System	Individual Level Training	●	There is a limited number of ranges that have targets that are automated or scored. Targets that do not provide scoring are less effective for improving weapons skills. Construction of automated target ranges on Okinawa would significantly reduce the volume of the high hazard impact areas. The Range Modernization/Transformation program provides upgrades within its available resources.
	Unit Level Training	●	Unit and MEU-level training requires enhanced instrumentation for training event reconstruction, debriefing, and replay. Without feedback, units do not know how effective their tactics and techniques are; nor do they have the opportunity to correct mistakes. The Marine Corps RM/T program continues to analyze and address these shortfalls through range investments consistent with available resources.
	MEU Level Training	●	Same as above.
Range Support	Individual Level Training	●	Due to emerging Pacific laydown, range staffing challenges continue to affect mission accomplishment, OPFOR readiness, and potentially safe operations that will be mitigated through a range capability study. The RM/T program upgraded the communications capabilities and installed IRSS to provide an air picture in 2011. This upgrade improved communications with ground units in the CTA; however, there is still limited communications capability with air units in the CTA. Overall, communications with ground and air units operating at ISTF and in the NTA remains very limited.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Small Arms Ranges	Individual Level Training	●	With inadequate landspace, ranges on Okinawa are built in-depth; which creates numerous conflicts between ranges reducing availability, capability and capacity. The targetry on existing ranges is very limited, which degrades their usefulness. Without adequate targets, individual weapons skills are degraded. There are initiatives to place additional non-automated targets in the impact area.
	Unit Level Training	●	Same as above, with exacerbated limitations.
Collective Ranges	Unit Level Training	●	Two ranges in Okinawa support live-fire and maneuver (LFAM) training to the platoon level, but none support live fire convoy operations. International agreements, such as DPRI, impact any significant attempt at expansion to develop LFAM or convoy ranges. Integrating supporting arms is limited to restricted mortar fires. This lack of LFAM and convoy ranges limits opportunities for ground units to train in an LFAM or combined-arms environment. Range Operations is working to expand the capabilities of the existing LFAM ranges.
	MEU Level Training	●	Same as above.
MOUT Facilities	Unit Level Training	●	There are three, small non-live fire, MOUT facilities in Okinawa. The largest is an eleven-building facility made up of shipping containers which could support training up to a company level, but there is not enough capacity to support all of the units that need it. MOUT facilities have tripled in recent years, as a result of the RM/T program. The few small MOUT facilities available on Okinawa limit the throughput and increase the competition to use them. In addition, their small sizes do not provide an effective venue for realistic MOUT training at the company and battalion level. The Marine Corps RM/T program continues to address shortfalls consistent with available assets. Range operations are working to develop new locations within the training areas to increase capabilities and expand MOUT facilities.
	MEU Level Training	●	Same as above.
Suite of Ranges	Unit Level Training	●	Effective training is possible on Okinawa; however, it takes imagination, creativity, scale-ability and a continuously aggressive outreach program to comply with the physical limitations of being located on a small island. International agreements, such as DPRI, impact expansion to develop suites of ranges.
	MEU Level Training	●	Same as above.




MCIPAC-MCB Butler Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Individual Level Training	●	MCB Camp Butler restricted SUA dimensions are very limited, particularly vertically. The ceiling varies from 1,000 feet MSL to 3,000 feet MSL and some of the instrument approaches into Kadena Air Base overfly the SUAs. The relatively low ceiling for the SUAs are minimally adequate to support individual weapons firing. The MCB Camp Butler restricted SUAs were established for military security reasons not involving aircraft operations or weapons firing. Expanding this restricted SUA vertically is being explored by MCIPAC and with the Japanese Civil Aeronautics Bureau. Warning SUAs are adequate for Individual Level Training.
	Unit Level Training	●	Same as above. In addition, the relatively low ceilings for the restricted SUA limits live fire operations, such as mortar employment; and prohibits fixed-wing aircraft from providing training support for ground units, such as Simulated Close Air Support (SIMCAS). Expanding this SUA vertically is being explored by MCIPAC and with the Japanese Civil Aeronautics Bureau; however, SIMCAS will remain supportable by Rotary-Wing (RW) only because of the size and geographic constraints of the training area and existing political constraints and noise concerns. Accordingly, Fixed-Wing (FW)/RW, CAS/SIMCAS, and Fire Support Team/FAC training occur at a very small island location off the west coast of the main island of Okinawa, which is well clear of the CTA. A work-around for mortar firing currently exists; however, limited dates are authorized monthly.
	MEU Level Training	●	Same as above.
Climate Impacts	Individual Level Training	●	Authorized ammunition are restricted based on fire conditions. Drought conditions affect fire condition ratings and are a major factor limiting mortar and high explosive ammunition firing. There is no known remedy.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Land Use	Individual Level Training	●	Public roads trisect all three training areas (CTA, NTA and ISTF) and small towns surround them. This is particularly evident near the Hansen impact area, located on the southwest end of CTA. In addition, tacit farms occupy a few areas within the border of the three training areas. Since there is no buffer between these towns and the training areas, noise from training, such as live fire and aircraft operations, migrate off-base. During certain times of the year, training operations may be limited or suspended to prevent open area/wild fires that can have any number of military or civilian ignition sources. Political sensitivities also affect allowable training dates throughout the year. Closing the range for open area/wildfires disrupts live fire training and could cause a degradation in unit readiness. Developing additional ranges in such a compact, urbanized area is very challenging. These constraints have limited training operations in the past and made expanding ranges very difficult. In order to realize effective training support, MCIPAC-MCB Butler requires flexibility and creative training. The DPRI reduces the impact and scope of U.S. Marine training on Okinawa. Expanding training space or capability requires support from the Departments of State and Defense through the USG/GoJ. Land return agreements from the 1970's to present day continuously reduce the amount of training areas (land, sea and air space) available for the U.S. Marine Corps on Okinawa. Expansion and increased training by the Japanese Ground Self Defense Force reduce accessibility and availability to ranges and training areas at CATC, Fuji. In addition, MV-22 and future aircraft training activities are not well received by the nearby population. There is no known solution.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Maritime	Individual Level Training	●	Per agreement with the GoJ, there are several water surface areas available for training 120 days per year with limited or no beach access and no contiguous training area. Encroachment from proposed commercial and municipal developments (resorts and public access) with political support has negatively impacted the Camp Hansen and Camp Schwab WSAs. Port access for water craft ranging in size from small boats to Landing Craft Utility very restrictive.
	Unit Level Training	●	Same as above, but even more aggravated in proportion to the size of the unit.
	MEU Level Training	●	Same as above, but even more aggravated in proportion to the size of the unit.
Other Regulatory Requirements	Individual Level Training	●	Small villages and municipalities surround the ranges and training areas. Japan has no zoning laws; therefore, there is no buffer between the townships and the ranges and training areas. Noise from training, especially live fire and aircraft operations, migrates off-base. Training operations may be limited as a result of having to operate in such a compact, urbanized area. Although the U.S. Marine Corps respects its surrounding communities, it must continue to train locally and conduct live-fire and aircraft operations. As a result, MCIPAC-MCB Camp Butler frequently encounters noise complaints in spite of GoJ funding landing zone relocation projects. Through its aggressive outreach program, MCIPAC-MCB Camp Butler works to minimize this impact. During certain times of the year, training operations are limited and/or suspended as a courtesy during school testing.
	Unit Level Training	●	Same as above, but even more aggravated in proportion to the size of the unit.
	MEU Level Training	●	Same as above, but even more aggravated in proportion to the size of the unit.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

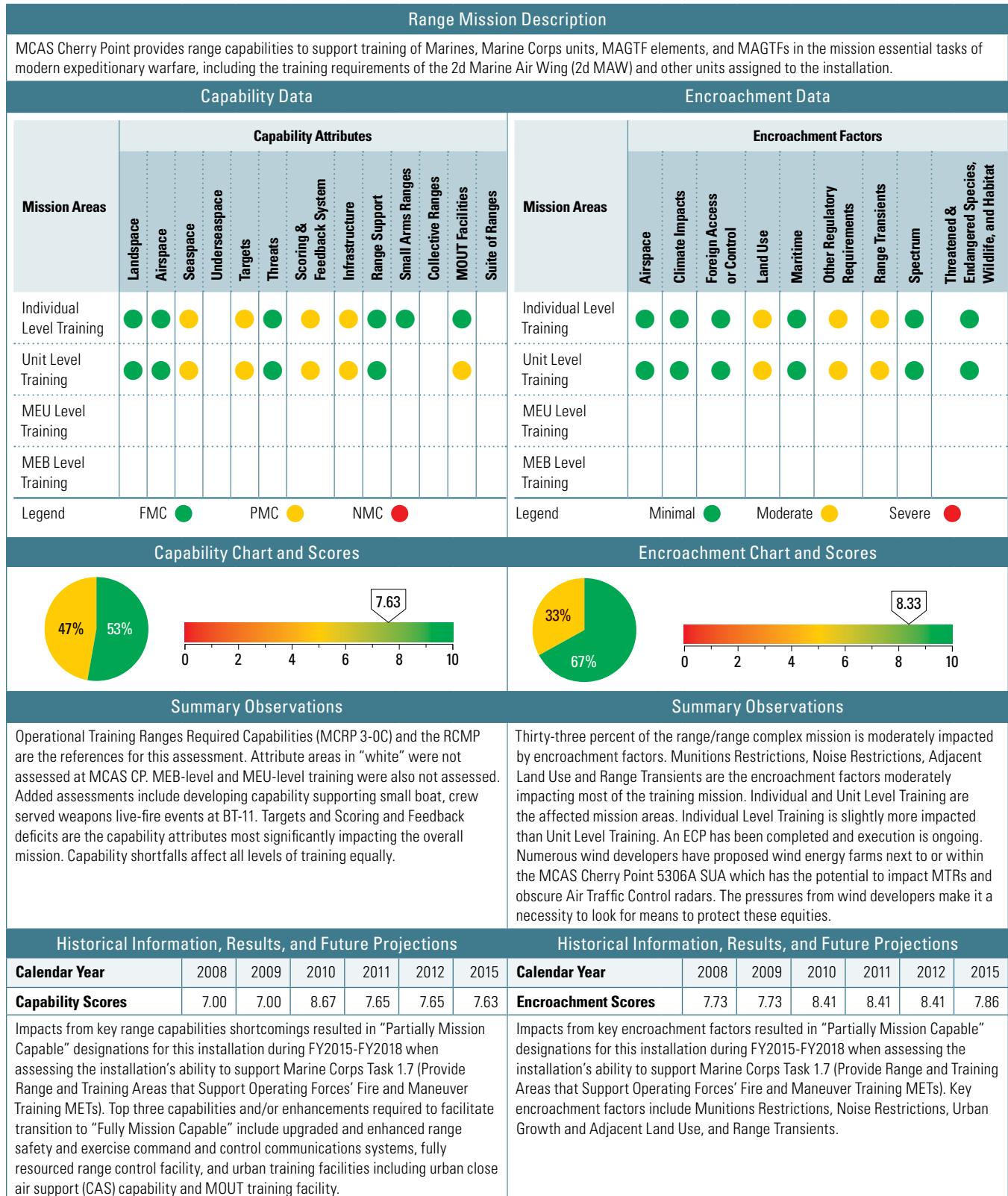
MCIPAC-MCB Butler Detailed Comments

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Spectrum	Individual Level Training		Frequency band widths (spectrum) are extremely limited in Japan. Unmanned Aerial System (UAS) are prohibited in Japan due to the operating frequencies interfering with the emergency service frequencies. Recent advancements in communication technology and other unmanned platforms have not received 'Host Nation' approval. The communications frequencies (UHF/VHF) for U.S. military use are very restricted. No available solution at this time.
	Unit Level Training		Same as above, but even more aggravated in proportion to the size of the unit or advancement in technologies.
	MEU Level Training		Same as above, but even more aggravated in proportion to the size of the unit or advancement in technologies.

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Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

MCAS Cherry Point Assessment Details



MCAS Cherry Point Detailed Comments

Capability Observations

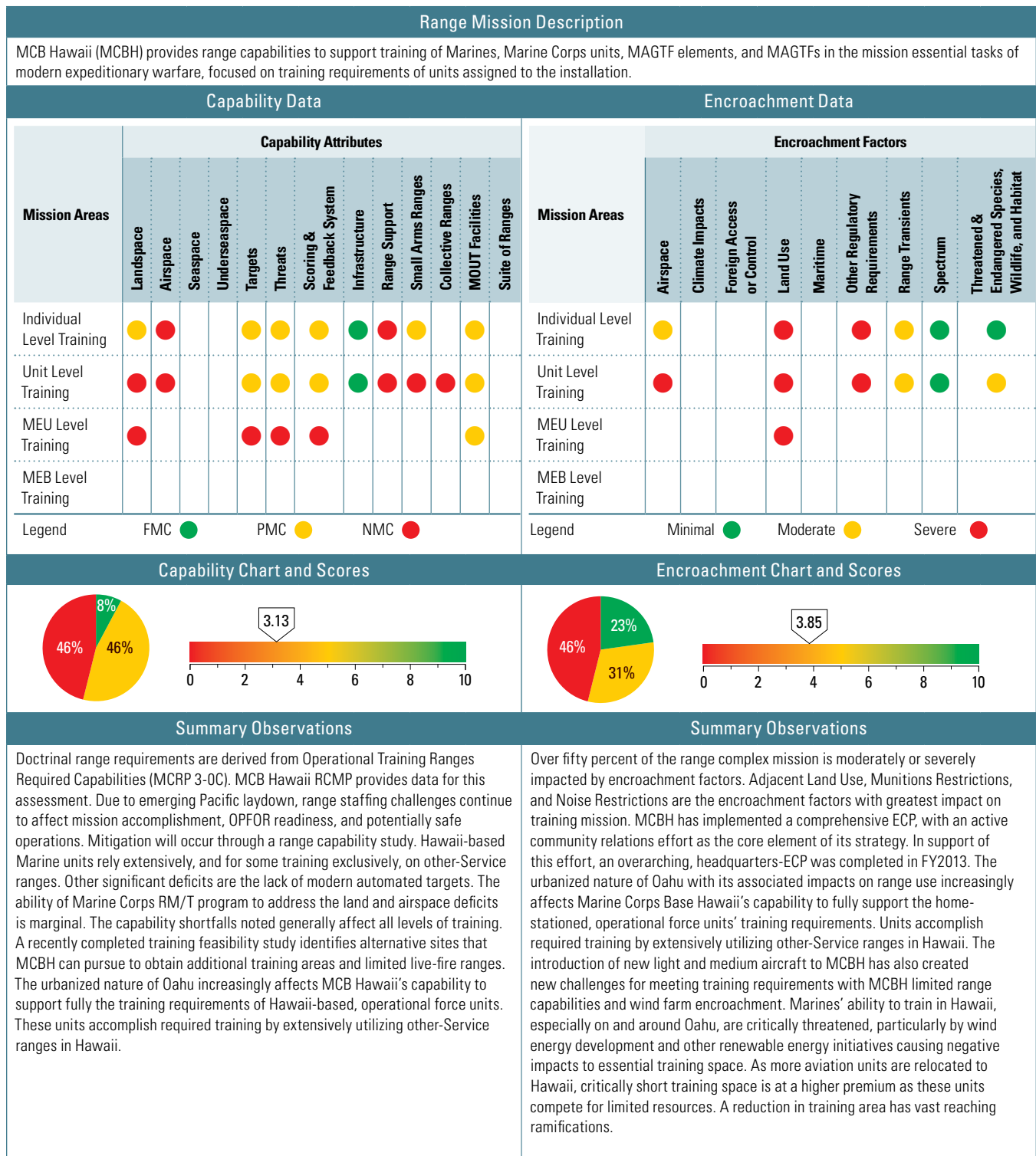
Attributes	Assigned Training Mission	Score	Comments
Seaspace	Individual Level Training	●	Challenges include new and developing capabilities supporting small boat crew-served weapons live fire events at BT-11. Waters surrounding BT-9 and BT-11 are public waters and any seaspace utilized for training by units stationed at MCAS Cherry Point is scheduled through the FACSAC VACAPES. Range Management has requested information regarding target requirements from Marine and Navy small boat teams. Once information is received, Range Management will determine the appropriate actions.
	Unit Level Training	●	Same as above.
Targets	Individual Level Training	●	Targets do not meet requirements of MCRP 3-0C. Ranges lack structural/urban targets. RM/T program is addressing shortfalls consistent with available resources and Marine Corps priorities.
	Unit Level Training	●	Same as above.
Scoring & Feedback System	Individual Level Training	●	Scoring and feedback systems do not meet requirements of MCRP 3-0C, which include automated scoring, real time feedback, and Voice/Auto Real Time Kill Notification (RTKN). Debrief/AAR requirements are available at host range facility, or remotely at another location, or both. MCAS Cherry Point scoring is automated via WISS or Hit/Miss calls via Range Operations.
	Unit Level Training	●	Same as above.
Infrastructure	Individual Level Training	●	Range control facility resourcing has been addressed with addition of dedicated personnel. Current communications shortfalls prevent communications with Atlantic Field and BT-11. Upon completion, range control infrastructure will be FMC.
	Unit Level Training	●	Same as above.
MOUT Facilities	Unit Level Training	●	Limited unit level MOUT capability. MCRP 3-0 requirement for MOUT (ACE) is a seven square mile facility with a three square mile live fire training area that includes SDZ for ground and aviation direct and indirect fire weapon systems. The airfield seizure facility at Atlantic Field is non-live fire and is not authorized for inert aviation weapons. This training can only be completed at MCAS Yuma and MCAGCC Twentynine Palms.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Land Use	Individual Level Training	●	Population growth in the region has resulted in increased housing and urban infrastructure construction in the vicinity of the installation and associated airspace and ranges. The changing land use increasingly impacts the Base's training flexibility. ALF Bogue also has major urban encroachment. BT-9 and BT-11 are affected by civilian use of surrounding waters. Examples of impacts include noise restrictions affecting munitions use and night training, increased light that conflicts with flight crew's use of night vision equipment, and alteration of flight patterns to avoid urban areas, both within restricted SUA and for low-altitude routes outside restricted airspace. Explosive storage areas are negatively impacted by flight corridor civilian overflight and vehicle traffic on adjacent roads. Cellular towers constructed proximal to MCAS Cherry Point boundaries can negatively affect operations by raising the weather minimums required for aircraft conducting instrument approaches. Actions to address impacts include community liaison; however, remedies remain elusive.
	Unit Level Training	●	Same as above.
Other Regulatory Requirements	Individual Level Training	●	The installation operates a Class C Range for explosive ordnance disposal. The range is capable of disposing of up to 150 lbs. net explosive weight (NEW); however, the base has self-imposed limitations of 50 lbs. The NEW limit is to ensure noise from detonations does not impact the nearby communities.
	Unit Level Training	●	Aerial bombing and gunnery ranges BT-9 and BT-11, situated on islands within R5306A, are surrounded by NC Public Trust Waters with the intra-coastal waterway splitting the two range areas. The area supports fisheries and recreation. Associated limitations on surface/weapons danger zone (SDZ/WDZ) restrict allowable munitions for aerial bombing and gunnery using BT-9 and BT-11. Inert ordnance only authorizes up to 500 lbs. at BT-11; 35 lbs. TNT equivalent for BT-9; and no cluster munitions. BT-9 and BT-11 range areas are also used by water-borne craft in practicing shallow water target engagements; however, the firing of primary weapons systems using .50 caliber munitions from surface platforms is restricted at BT-11. Actions to address the issues include community liaising; however, remedies remain elusive.
Range Transients	Individual Level Training	●	The waters surrounding BT-9 and BT-11 are used extensively for civilian activities. MCOLF Atlantic is a high value 1,200 acre airfield facility used for numerous supporting arms (aviation) activities. This airfield is subject to incursions by recreational off-road vehicle users. Actions to address impacts include patrolling, reporting, and community liaison.
	Unit Level Training	●	Same as above.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

MCB Hawaii (MCBH) Assessment Details



MCB Hawaii (MCBH) Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	4.47	4.47	4.55	4.09	4.09	3.70	Encroachment Scores	7.27	7.27	6.19	6.19	6.19	5.95
Impacts from shortcomings in key range capabilities have resulted in “Partially Mission Capable” designations for this installation during FY2015–FY2018 when assessing the installation’s ability to support Marine Corps Task 1.7 (Provide Range and Training Areas that Support Operating Forces’ Fire and Maneuver Training METs). Capabilities and/or enhancements required to facilitate transition to “Fully Mission Capable” include sufficient land and airspace to support a MEU/BLT non live-fire maneuver in the Hawaiian Islands; non-existent Range Control Facility Tables of Organization (T/O), and scored aviation and ground ranges.							Impacts from key encroachment factors resulted in “Partially Mission Capable” designations for this installation during FY2015–FY2018 when assessing the installation’s ability to support Marine Corps Task 1.7 (Provide Range and Training Areas that Support Operating Forces’ Fire and Maneuver Training METs). Successful mitigation of key encroachment factors include adjacent land use, munition restrictions, and noise restrictions. These actions are required to facilitate transition to a “Fully Mission Capable” designation.						

MCBH Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Individual Level Training	●	MCBH ranges support limited live fire training at the individual level. Live fire training of artillerymen and heavy mortar-men is prohibited on MCBH ranges. Convoy operations training is not feasible due to space constraints. Combat logistics training using heavy equipment is severely constrained by space limitations. Required training relies on use of other-Service ranges and airspace in Hawaii, which requires travel with associated costs and is further constrained by competition to use the ranges. The logistics, costs, and time to conduct required training increase when it is conducted off-island at another Military Service range. Additionally, an overall shortage of ranges and training areas for all Services on Oahu creates significant scheduling and coordination challenges. A majority of field training for all Marines must be conducted off of MCBH at satellite ranges and training areas or on other-Military Service ranges. A recent training area analysis study based upon the required range capability document indicates MCB Hawaii should have 165,000 acres of maneuver training area land and airspace. MCB Hawaii has less than 2,000 acres dedicated to training and all of that space is encroached upon and has severe use restrictions.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Due to a lack of sufficient training lands, battalion-level training is not feasible. Home-stationed units of the 3rd Marine Infantry Regiment rely on the use of other-Service ranges and airspace in Hawaii to accomplish their training. The logistics, costs, and time to conduct required training increase when it is conducted off-island at another Military Service range.
Airspace	Individual Level Training	●	The composition of Marine Aircraft Group 24 (MAG24) has changed significantly during the past few years and will continue to change through 2017. The addition of an HMLA with AH-1Ws and UH-1Ys has increased aerial gunnery requirements and the total number of aircraft that need to fly TERF. VMM squadrons and MV-22Bs have generated new requirements for a low altitude tactics (LAT) route. MCB Hawaii currently has no restricted airspace and does not possess an air gunnery range. There is no USMC-owned tactical flight training area available to MAG24, there is no LAT flight area for the tilt rotor squadrons or UAS training area. MAG 24 is completely reliant upon other services training areas to meet basic METs. Access to Army aviation ranges on Oahu has been limited to date due to challenges with nearby citizens.
	Unit Level Training	●	Same as above.
Targets	Individual Level Training	●	MCBH ranges lack automated, fixed and mobile targets. This shortfall reduces training realism, effectiveness, and training assessment capability. A lack of available training space severely constrains options for range development, threat system employment, and target emplacement; consequently, this shortfall is not likely to be remedied on MCBH ranges.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above. Training constraints due to lack of available training space are most severe for larger units and MAGTFs.
Threats	Individual Level Training	●	MCBH ranges lack realistic, modern threat representation/simulation capability. This shortfall reduces training realism, effectiveness, and training assessment capability. A lack of available training space severely constrains options for range development, threat system employment, and target emplacement; this shortfall is not likely to be remedied on MCBH ranges.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above. Training constraints due to lack of available training space are most severe for larger units and MAGTFs.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

MCBH Detailed Comments

Capability Observations			
Attributes	Assigned Training Mission	Score	Comments
Scoring & Feedback System	Individual Level Training	●	MCBH range complex lacks real-time training feedback systems. This shortfall reduces training realism, effectiveness, and training assessment capability. The RM/T program is addressing shortfalls consistent with available resources and Service priorities.
	Unit Level Training	●	Same as above. In addition, the lack of available training space severely constrains options for range development, threat system employment, and target emplacement.
	MEU Level Training	●	Same as above.
Range Support	Individual Level Training	●	Due to emerging Pacific laydown, range staffing challenges continue to affect mission accomplishment, OPFOR readiness, and potentially safe operations that will be mitigated through a range capability study.
	Unit Level Training	●	Same as above.
Small Arms Ranges	Individual Level Training	●	Insufficient land area for range development limits required small arms training to static ranges. The comments regarding deficits in Targets, Threat Systems, and Scoring & Feedback capabilities are also pertinent. This shortfall reduces the effectiveness of live-fire training. Units rely on other-Services, more advanced range capabilities to meet training requirements.
	Unit Level Training	●	Same as above, with exacerbated limitations.
Collective Ranges	Unit Level Training	●	Insufficient land area for range development and lack of SUA preclude conducting collective training except at most basic levels on MCB Hawaii ranges. This shortfall limits the utility of MCBH ranges to support collective training. Units are forced to use available other-Service ranges to accomplish required training.
MOUT Ranges	Individual Level Training	●	The Immersive Infantry Trainer (IIT) MOUT facility at the Marine Corps Training Area Bellows has improved MCBH's MOUT capability, but a medium to large MOUT is still not available. MCBH lacks a significant live-fire MOUT capability. Modular MOUT facilities have been constructed at the US Army Pohakuloa Training Area, but are not readily accessible for training.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Airspace	Individual Level Training	●	Kaneohe Range Training facility recently established a Controlled Firing Area (CFA) SUA through the FAA and has submitted an initiative requesting restricted SUA ISO aerial gunnery and UAS operations. Encroachment from wind farm developers in the vicinity of the Kahuku Training Area has negatively impacted aviation units from conducting integrated training. Civilian aviation operations encroach upon training areas that fall outside controlled airspace - with additional aviation assets across the DoD relocating to Hawaii, the areas have become further congested.
	Unit Level Training	●	Same as above, but even more aggravated in proportion to the size of the unit.
Land Use	Individual Level Training	●	Due to proximity of civilian housing and other community infrastructure, live fire training is prohibited at Marine Corps Training Area Bellows (an amphibious and MOUT training area), and is limited at Kaneohe Bay. The urbanized character of the area constrains the development of ranges. As a result, training is generally confined to non-live fire events or the use of static positions when firing small arms. Extremely limited ship-to-shore training areas are available. Community noise concerns are pervasive. Light sources in surrounding communities preclude night vision training for air crews. Convoy training on public roads is not feasible due to traffic congestion. All of these constraints reduce the effectiveness of training to some extent. As a result, much of this training is forced off-island to other-Service ranges. Marines' ability to train in Hawaii, especially on and around Oahu, are critically threatened, particularly by wind energy development and other renewable energy initiatives causing negative impacts to essential training space. As more aviation units are relocated to Hawaii, critically short training space is at a higher premium as these units compete for limited resources. A reduction in training area has vast reaching ramifications.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.

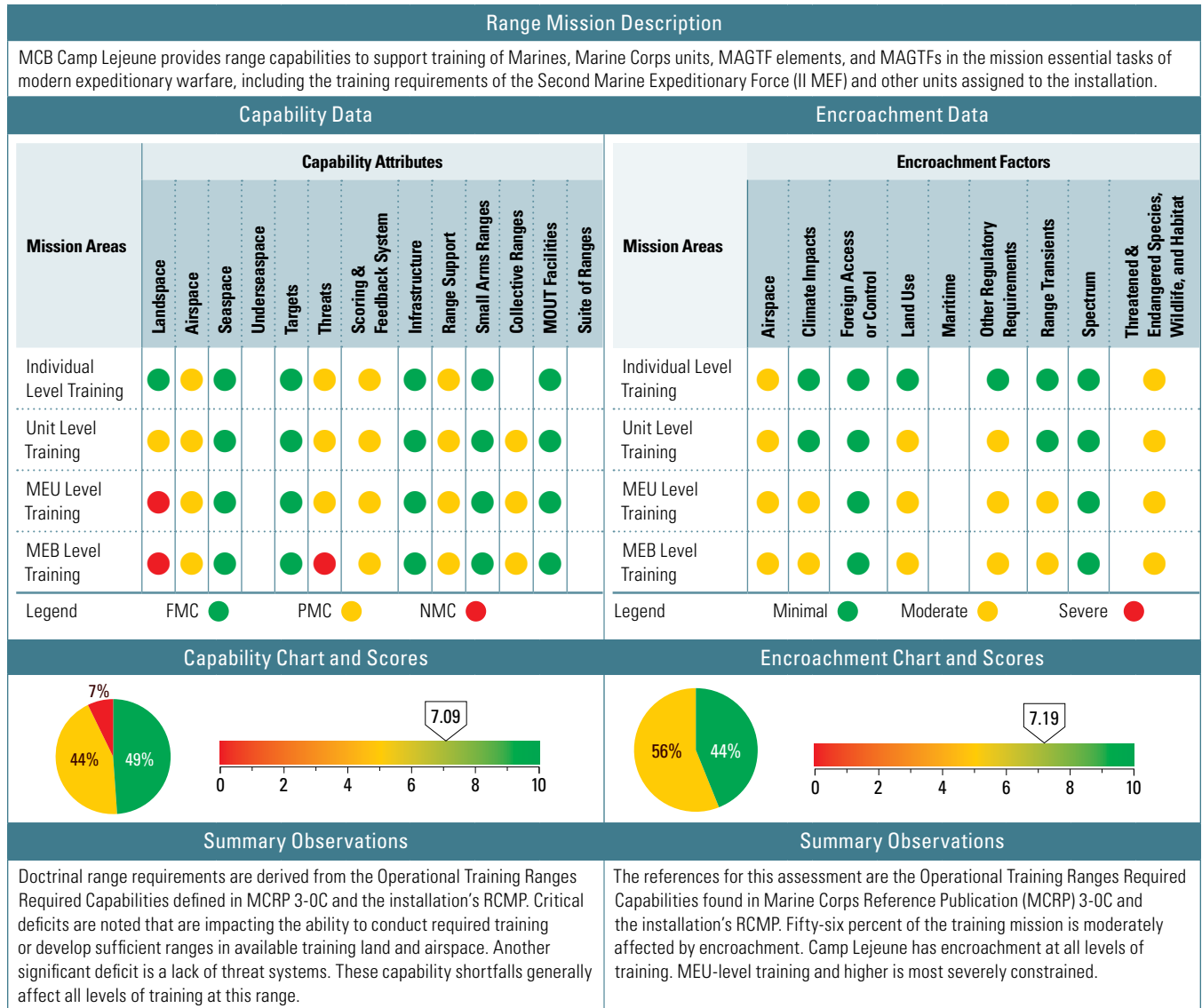
MCBH Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Other Regulatory Requirements	Individual Level Training	●	Live fire training using artillery or 81 mm mortar munitions are prohibited on MCBH ranges. This shortfall negatively impacts training for infantry weapons companies and artillery batteries. These units are forced to accomplish this training at other Service ranges in Hawaii. Marine Corps Training Area Bellows is the only USMC owned maneuver training area in the Hawaiian Islands. Due to the close proximity of civilian housing on three sides of the training area the commanding officer of MCB Hawaii has imposed "quiet hours" for the training area. Blank fire, counter-improvised explosive device, helicopter landings, AAV operations training must not occur prior to 0700 on weekdays and cease at 2200. On weekends and holidays training that results in loud noise cannot begin until 0900 and must end at 2200. Puuloa Range Training Facility (PRTF) is subject to noise restrictions 0700 until 1700.
	Unit Level Training	●	Same as above, but even more aggravated in proportion to the size of the unit.
Range Transients	Individual Level Training	●	MCBH live fire ranges are required to cease operations when civilian watercraft enter the confines of a range surface danger zone (SDZ), which extends into the ocean behind the impact area. These intermittent cease fire events disrupt and degrade live fire training events. The cost to provide personnel to watch the area is approximately 3,000 man hours per year. To mitigate these training interruptions the following measures have been adopted: placing personnel to watch for boat traffic in range's SDZ; providing the ranges with radios to communicate with boat traffic; and directing available military vessels to intercept civilian boats in SDZs. In addition, updated notices to all mariners have been published.
	Unit Level Training	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Unit Level Training	●	Kaneohe Range Training facility has a Wildlife Management Area (WMA) in the top center of the impact area for the red-footed booby. The red-footed booby is not endangered but rather protected under the Migratory Bird Treaty Act. The presence of the birds causes restrictions. There are no tracers, illum or marking rounds permitted, and the impact area is segmented in order to keep high explosive impact area as far from the WMA as possible. This is a severe restriction on crew served weapons training such as mortars, MK19 and rockets. SMAW tracers are not permitted.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

MCB Camp Lejeune Assessment Details



MCB Camp Lejeune Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	5.24	5.24	6.33	5.83	5.83	5.83	Encroachment Scores	7.58	7.58	7.58	7.58	7.27	7.27
Impacts from key range capabilities shortcomings resulted in “Partially Mission Capable” designations for this installation during FY2015–FY2018 when assessing the installation’s ability to support Marine Corps Task 1.7 (Provide Range and Training Areas that Support Operating Forces’ Fire and Maneuver Training METs). Top capabilities and/or enhancements required to facilitate transition to “Fully Mission Capable” include off-base MV-22 tactical training areas/landing zones and a combined arms maneuver course for individual, unit collective, and MEU level training.							Impacts from key encroachment factors resulted in “Partially Mission Capable” designations for this installation during FY2015–FY2018 when assessing the installation’s ability to support Marine Corps Task 1.7 (Provide Range and Training Areas that Support Operating Forces’ Fire and Maneuver Training METs). Successful mitigation of key encroachment factors include threatened and endangered species/critical habitat, munitions restrictions, airspace restrictions, and urban growth. These actions are required to facilitate transition to a “Fully Mission Capable” designation. There are five major encroachment factors at this installation. The first is the threatened and endangered species federal regulations which effectively closes-off significant portions of the training areas for all or major portions of unit training. The second factor is that Camp Lejeune is conducting larger training exercises to compensate for the reduction in major deployments, which in turn increases the number of noise complaints from surrounding communities. This creates the need for buffers of forestry or other barriers from surrounding developments. The third factor is the restrictions on most training areas caused by the protection measures in place to support the recovery of the RCW in these areas. The RCW Recovery and Sustainment Program (RASP) should significantly improve the ability of the Base to develop new ranges and remove these restrictions. A fourth factor is that the loss of airspace over Camp Lejeune creates a corridor of civilian controlled airspace between the east and west sides of the installation. This raises significant problems for UAS training. The final factor is the permanent erosion of the training beach of Camp Lejeune (Onslow Beach) on the south end. Rising sea level, shifting dunes, and storm overwash will result in the loss of the southern two to three miles of beach used in training. This loss directly impacts amphibious operations, will impinge upon recreational use of the beaches, and will affect threatened and endangered species nesting and monitoring.						

MCB Camp Lejeune Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Unit Level Training	●	Available land training area limits options for siting/development of new ranges. Range planning seeks to maximize efficient use of available land for training. Expansion is not feasible. Landspace requirements include off installation areas for dedicated landing zone use by MV-22 aircraft. Remedy has begun with MCB Camp Lejeune entering into two leases on public lands for Tactical Landing Zones to accommodate off-site MV-22 operations.
	MEU Level Training	●	Land training area does not meet MCRP 3-OC requirements. Range planning seeks to maximize efficient use of available land for training. Expansion is not feasible.
	MEB Level Training	●	Same as above.
Airspace	Individual Level Training	●	Concerns include airspace limitations (i.e., surface to 17,999 feet). Airspace does not extend 10NM beyond land area as necessary to avoid “spill outs” by military aircraft and incursions over ranges by civilian aircraft, supersonic flight is not authorized, and fixed wing flight operations are restricted. Urbanization issues (e.g., noise and light) limit use of training airspace that is not SUA, including extended range airspace areas required for MV-22 tactical training. There is no known remedy at this time.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
	MEB Level Training	●	Same as above.
Threats	Individual Level Training	●	RM/T program is addressing shortfalls consistent with available resources and Service priorities. OPFOR are provided by contracted theater specific role players who are not formally instructed on enemy tactics, techniques and procedures; however, role players provide a second best alternative. OPFOR is not dedicated, normally makeshift, and controlled by handlers. OPFOR is not trained to enemy tactics or techniques.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
	MEB Level Training	●	Same as above.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

MCB Camp Lejeune Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Scoring & Feedback System	Individual Level Training	●	Concerns include Tracking—Radar Inputs Only; RC—2-D Capability Only; EC&C—Operational Unit Owned and Operated; M&S—Only S-S Scenarios; Scoring—At least 1 range to Training Standard; Debrief/AAR—Primarily Observers/Hit-or-Miss Targets. RM/T program is addressing shortfalls consistent with available resources and Service priorities.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
	MEB Level Training	●	Same as above.
Range Support	Individual Level Training	●	Automated targetry requires detailed wiring, extensive protective coffins and timbers, earthen berms and other protective measures to protect the target mechanisms from damage. The amount of maintenance required to maintain this level of protection is extensive and results in long periods of “down time” for ranges in order to accomplish the maintenance. As targetry requirements become more complex, the ability of the Marine Corps to operate and maintain the ranges is reduced and requires a greater dependency on maintenance support contracts.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
	MEB Level Training	●	Same as above.
Collective Ranges	Unit Level Training	●	See prior comments attributed to land, airspace, range control, and target deficits. RM/T program is addressing shortfalls consistent with available resources and Service priorities.
	MEU Level Training	●	Same as above.
	MEB Level Training	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Individual Level Training	●	No fixed wing operations are allowed in R5303 and R5304. Ranges that the SUA supports cannot be active unless the area has aviation radar coverage. R5306D cannot be expanded due to civilian use of local beaches and Highway 17 corridor. There is no known remedy at this time.
	Unit Level Training	●	Ship to shore movements require aircraft to utilize airspace other than restricted areas to complete scenario based training. Increased civilian density in nearby areas leads to increased noise complaints about aircraft flying tactical profiles during the day and night. Loss of contiguous airspace is affecting UAS operations and indirect fire weapon systems. Close coordination and expedited procedures with the FAA are necessary to ensure that the capabilities of aircraft and indirect fire weapons systems can be fully exercised by relinquishing airspace control for military operations on an as necessary basis.
	MEU Level Training	●	Same as above.
	MEB Level Training	●	Same as above.
Climate Impacts	MEU Level Training	●	Camp Lejeune has documented evidence of the progressive loss of its primary training beach due to sea-level rise, storm surge, and loss of barrier dunes. The loss of beach restricts simultaneous training events. There is no known remedy at this time.
	MEB Level Training	●	Same as above.
Land Use	Unit Level Training	●	From 1990 to 2000, the population of the region of Camp Lejeune (Onslow County, NC) was essentially stable (1990 pop-149,838; 2000 pop.-150,335 [U.S. Census Bureau]). Between 2000 and 2008, the population surged, with an increase of over ten percent. This trend continues, resulting in increased construction of housing and other urban infrastructure in the vicinity of the base and associated training areas and airspace. The changing land use increasingly impacts the base's flexibility to execute training. Examples of impacts include noise restrictions affecting munitions use and night training, increased light that conflicts with flight crew's use of night vision equipment, and alteration of flight pattern to avoid new housing areas. Actions to address these issues include significant community outreach; however, remedies remain elusive.
	MEU Level Training	●	Same as above.
	MEB Level Training	●	Same as above.

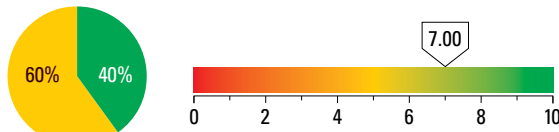
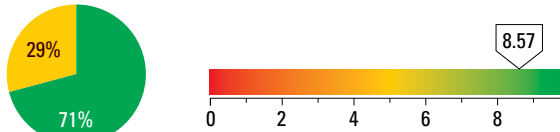
MCB Camp Lejeune Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Other Regulatory Requirements	Unit Level Training	●	Bombing operations at Camp Lejeune are restricted to inert ordnance, due in part to concerns about the noise levels from use of explosive ordnance. Regulatory constraints due to wetlands and T&E species confine tracked and armored vehicles such as tanks to existing trails; therefore maneuver training for tanks and armored vehicles cannot be accomplished above the section/platoon level.
	MEU Level Training	●	Same as above.
	MEB Level Training	●	Same as above.
Range Transients	MEU Level Training	●	Silting in the intra-coastal waterway causes civilian vessels (usually recreational) to sometimes run aground in inlets adjacent to or within the base (Browns and New River), leading to training disruptions. Remedies include ongoing activities with community liaison.
	MEB Level Training	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Individual Level Training	●	<p>Training is constrained due to the presence of ESA-listed RCW, especially within the high value training areas. These constraints are addressed with the Environmental Division and the USFWS as range development and maneuver training requirements are identified. Remedies include ongoing consultation with USFWS concerning impacts of vegetation clearing within the G-10 Impact Area and RCW sites surrounding the impact area, potentially impacting further range development.</p> <p>The introduction of the RCW RASP at Camp Lejeune is a major step towards reducing the impact of federal requirements for a threatened and endangered species by entering into land management agreements and conservation easements with surrounding State/Federal agencies, Non-Governmental Organizations and Privately owned properties. This agreement transfers a portion of the recovery goal for the installation to those properties with an approved Land Management Plan approved by the USFWS. This will expand options for new range development as required on the installation without threat of a jeopardy determination for the species by the USFWS.</p>
	Unit Level Training	●	Same as above. Additionally, constraints due to T&E species and wetlands confine tracked and armored vehicles such as tanks to existing trails. This means maneuver training for armored vehicles cannot be accomplished above section/platoon level. Also, habitat and other environmental concerns have made range enhancements and site selection for new ranges difficult, and, in some instances, have forced the Base to choose less desirable alternatives or limit range size/capability. The increased range of weapons systems cannot be accommodated on the current range footprint. Remedies to this issue are unknown at this time.
	MEU Level Training	●	Same as above. Additionally, there are constraints on training due to the presences of ESA-listed sea turtles on beaches during breeding season (May-Oct). Use of much of the beach is restricted for amphibious and other types of training during this time. Dunes are "out of bounds" and must be maneuvered around. A remedy to this issue is unknown at this time.
	MEB Level Training	●	Same as above.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

MCAS Miramar (Camp Elliott) Assessment Details

Range Mission Description																									
MCAS Miramar provides range capabilities to support the training of Marines at the individual and unit level. East Miramar has two range complexes and an EOD range. Five training areas and the Hathcock Rifle and Pistol Ranges support annual re-qualification and some unit level training. Small Arms Ranges B, C, and D support quarterly PMO pistol/shotgun requirements, the Marine Corps Police Academy pistol/shotgun qualification, Army, Navy, Marine Corps Reserves as well as many outside federal agencies (ICE, ICE-ERO, Border Patrol, DHS, FBI, Postal Inspectors, Secret Service, VA Police). The EOD range supports station and 3dMAW requirements as well as emergency destruction. Navy units regularly use the EOD range. The five training areas support local USMC units with small unit level training/tactics, driver's training, land navigation, hikes, COMMEs, and reconnaissance selection occupation position (RSOP). Other users include Navy, Army Reserves, ROTC, NROTC.																									
Capability Data													Encroachment Data												
Mission Areas		Capability Attributes											Mission Areas		Encroachment Factors										
		Landspace	Airspace	Seaspace	Underseaspace	Targets	Threats	Scoring & Feedback System	Infrastructure	Range Support	Small Arms Ranges	Collective Ranges			MOUT Facilities	Suite of Ranges	Airspace	Climate Impacts	Foreign Access or Control	Land Use	Maritime	Other Regulatory Requirements	Range Transients	Spectrum	Threatened & Endangered Species, Wildlife, and Habitat
Individual Level Training		●	●					●	●	●					Individual Level Training	●	●		●		●	●	●	●	
Unit Level Training		●	●					●	●	●					Unit Level Training	●	●		●		●	●	●	●	
MEU Level Training															MEU Level Training										
MEB Level Training															MEB Level Training										
Legend		FMC ●		PMC ●			NMC ●							Legend		Minimal ●			Moderate ●			Severe ●			
Capability Chart and Scores													Encroachment Chart and Scores												
																									
Summary Observations													Summary Observations												
The references for this assessment are Operational Training Ranges Required Capabilities (Marine Corps Reference Publication [MCRP] 3-0C). Regulatory constraints slightly limit the use of training areas due to presence of federal waterways, vernal pools, and species such as the fairy shrimp, least vireo, and gnat catcher. The upward trend in urban development within the region will continue to exert ever-increasing pressure on training capabilities.													Encroachment issues are primarily the result of civilian hikers/bikers deliberately trespassing onto MCAS Miramar and causing vandalism or range stoppage. MCAS Miramar now allows civilians to access the historic Stowe Trail in East Miramar which is coordinated by the Community Plans and Liaison Office (CPLO). Intense competition and pressure from general aviation for access to and use of airspace in the critically overcrowded, Southern California inland airspace corridors threatens to impact military aviation and live fire operations in ranges and training areas.												
Historical Information, Results, and Future Projections													Historical Information, Results, and Future Projections												
Calendar Year		2008	2009	2010	2011	2012	2015	Calendar Year		2008	2009	2010	2011	2012	2015										
Capability Scores		N/A	N/A	N/A	N/A	N/A	N/A	Encroachment Scores		N/A	N/A	N/A	N/A	N/A	N/A										
The LOMAH range has become outdated; replacement parts are difficult to locate and are no longer being produced. This system needs to be upgraded to prevent delays and loss of training. Additionally, the pistol range complex (Bravo, Charlie, and Delta) is in need of infrastructure upgrades.													Impacts from encroachment have been mitigated by allowing civilians to enter the historic Stowe Trail in East Miramar. Successful mitigation of key encroachment factors is required to facilitate transition to an FMC designation. These factors include urban growth and land use (i.e. infrastructure, general aviation airspace, etc.); threatened and endangered species; waterways and vernal pools; as well as cultural resources and historic properties.												

MCAS Miramar (Camp Elliott) Detailed Comments

Capability Observations

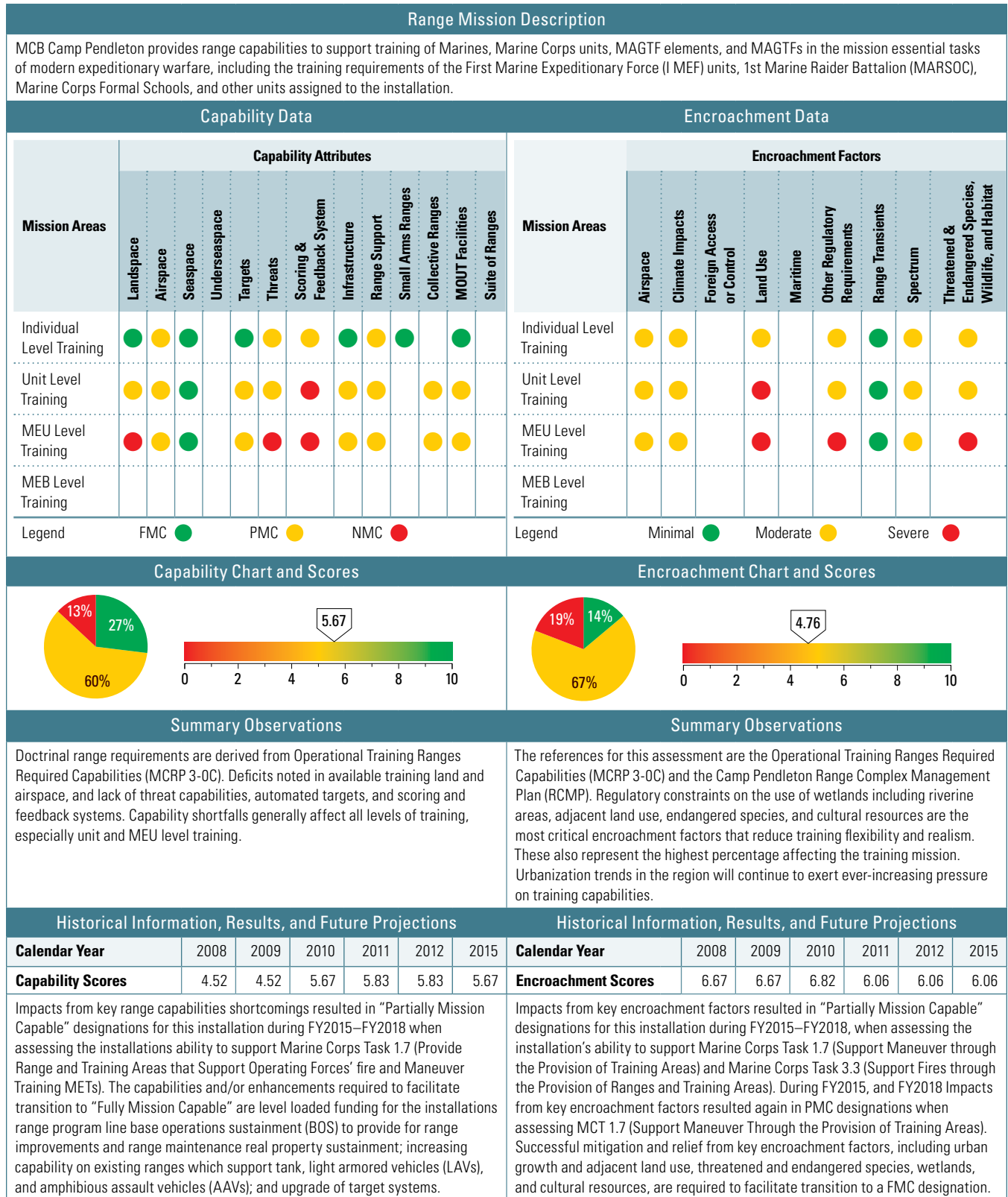
Attributes	Assigned Training Mission	Score	Comments
Landspace	Individual Level Training	●	Land training area does not meet Operational Training Ranges Required Capabilities for some units with larger caliber (>7.72) and machine gun. The size of the main impact area limits or prohibits the use of certain weapons, such as HIMARS, fixed-wing bombs, and hellfire missiles. Numerous units are compressed into the same training areas, which can reduce realism. Range planning seeks to maximize efficient use of available land for training. During the past seven years, the base has converted previously leased agricultural areas for training areas. Expansion beyond the range boundary is not feasible.
	Unit Level Training	●	Same as above.
Airspace	Individual Level Training	●	Support to the OPFOR and supporting establishment RTA users is limited due to the installation not having SUA in support of the RTA training activity. Depending on the airfield hours, either Class D or Class B airspace is active; either of which complicate and form a basis of reluctance to support heliborne/sUAS operations in the RTAs for elements of the Marine Expeditionary Forces that use MCAS Miramar as laydown. Intense competition and pressure from general aviation for access to airspace in the critically overcrowded Southern California inland airspace corridors does not support the expansion of SUA. The result is limited air support training for ground based training exercises. The lack of SUA requires training to be conducted in class B airspace which has deterred heliborne training operations within the training areas.
	Unit Level Training	●	Same as above.
Infrastructure	Individual Level Training	●	Many of the roads in the training areas are unimproved dirt roads, which are susceptible to rutting, surface erosion, and wash out during rainy periods. Large sections of the training area become inaccessible during rainy periods due to road closures and damage, which condenses training to the parts of the station that are still accessible. The station annual fuel break/MSR repair work maintains accessibility for the unimproved roads.
	Unit Level Training	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Individual Level Training	●	Intense competition and pressure from general aviation for access to and use of airspace in the critically overcrowded Southern California inland airspace corridors threatens to impact military aviation and live fire operations in ranges and training areas. These concerns are addressed in inter-agency dialogue with the station FAA ATREP.
	Unit Level Training	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Individual Level Training	●	Constraints on training due to presence of multiple ESA-listed species include inability to conduct training that requires digging/earth moving; limitations on use of military vehicles in some training areas; limitations on training with the use of blanks and pyrotechnics during breeding season.
	Unit Level Training	●	Same as above.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

MCB Camp Pendleton Assessment Details



MCB Camp Pendleton Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Unit Level Training	●	Land training area does not meet operational training range required MCRP 3-0C capabilities. The size of the main impact area limits or prohibits the use of certain weapons, such as HIMARS, FW bombs, and hellfire missiles. Numerous units are compressed into the same training areas, which can reduce realism. Range planning seeks to maximize efficient use of available land for training. During the past seven years, the base has converted previously leased agricultural areas for training areas. Expansion beyond the base border is not feasible.
	MEU Level Training	●	Same as above. In addition, MEU amphibious operations are limited to a small section of Camp Pendleton's beaches. The limited beach areas available for training, limit flexibility and reduce training realism. The base is pursuing initiatives to open up some of the restricted beach areas for training.
Airspace	Individual Level Training	●	Camp Pendleton SUA lacks sufficient capacity to support simultaneous individual and unit level training activities that are considered hazardous to non-participants. Such activities include, but are not limited to current and prototype UAS; aerial gunnery; air-delivered guided missile systems; HIMARS; large scale indirect firing exercises; Marine Corps Combat Readiness Evaluation exercises; and expanded formal schools curriculum, to include the introduction of a UAS course of instruction. In addition, the airspace generally does not support MV-22 LZ training requirements due to the large amounts of airspace required to conduct, high-speed, low-altitude, tactical operations. FW aircraft supporting CAS training must fly a very tight pattern to avoid spill outs, which reduces training effectiveness for the aircrew. Expanding Camp Pendleton's SUA in the congested Southern California airspace is not feasible. UAS use has increased with the addition of the Training And Logistic Support Agency (TALSA) West as well as the siting of VMU-4 aboard the installation.
	Unit Level Training	●	Individual unit level Group I UAS and small unmanned aircraft system (sUAS) training will significantly increase as infantry units are equipped with emerging offensive and defensive systems. Camp Pendleton lacks airspace capacity to safely and efficiently integrate and support multiple manned and unmanned aviation systems, and indirect and direct fire weapons systems.
	MEU Level Training	●	Same as above.
Targets	Unit Level Training	●	There are a number of required ranges and target areas that need modernization to meet USMC training requirements. These shortfalls span all levels of unit training to include Marine Corps Combat Readiness Evaluation. Shortfalls include infantry and mechanized automated ranges and targets, battle-course ranges, and targets. These shortfalls limit realistic training opportunities. The Marine Corps RM/T program is addressing these shortfalls through range investments consistent with available resources and Service priorities, as well as seeking relief from environmental training restrictions through consultations with U.S. Fish and Wildlife Service through the Readiness and Environmental Protection Integration (REPI) Program.
	MEU Level Training	●	Same as above.
Threats	Individual Level Training	●	Camp Pendleton requires a comprehensive electronic training environment supporting basic through advanced collective training. The capability must simulate neutral, hostile, and non-hostile ground, battle field effects systems, air defense, and airborne weapons systems; OPFOR C2; neutral, hostile and non-hostile cyber-threat systems; and hostile jamming. This shortfall limits training realism, because Marines are not exposed to electronic threats and do not learn how to identify and work around them. There are efforts underway to study OPFOR capability alternatives and to develop shortfall strategies. Role player program (not a program-of-record) is a significant training enhancement.
	Unit Level Training	●	Same as above. Shortfalls in threat capabilities have most significant impact on more complex training events.
	MEU Level Training	●	Same as above. Shortfalls in threat capabilities have most significant impact on more complex training events.
Scoring & Feedback System	Individual Level Training	●	Many existing ranges lack modern scoring and feedback systems. Without feedback, Marines often do not know if they are employing their weapons effectively. Lack of communication infrastructure to support the use of force-on-force training systems across larger areas of the installation. The Marine Corps RM/T program is addressing these shortfalls through range investments consistent with available resources.
	Unit Level Training	●	Unit and MEU-level training requires enhanced instrumentation for training event reconstruction, debriefing, and replay. Camp Pendleton generally lacks such capabilities. Without feedback, units do not know how effective their tactics and techniques are, nor do they have the opportunity to correct mistakes. The Marine Corps RM/T program continues to analyze and address these shortfalls through range investments consistent with available resources. Construction of a state-of-the-art large instrumented MOUT facility has mitigated the issue in one area, but an extensive number of ranges still do not have scoring and feedback systems.
	MEU Level Training	●	Same as above.
Infrastructure	Unit Level Training	●	Many of the roads in the training areas are unimproved dirt roads, which are susceptible to rutting, surface erosion, and wash out during rainy periods. Large sections of the training area become inaccessible during rainy periods due to road closures and damage, which condenses training to the parts of the Base that are still accessible. The base has completed an EA to improve portions of the training road network and areas will be addressed as resources become available. Another EA is underway which when complete will allow the base to maintain and sustain roads on a consistent basis provided funding is available.
	MEU Level Training	●	Same as above.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

MCB Camp Pendleton Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Range Support	Individual Level Training	●	Line-of-sight radio coverage degrades overall communication capability due to varying and undulating terrain. Although redundancy exists in the current system, the installation does not have a dedicated secondary range communication system associated with individual ranges. With the understanding range communications are not supported by USMC C4I, the Marine Corps Range RM/T program continues to analyze and address these shortfalls through range investments consistent with available resources.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Camp Pendleton lacks comprehensive exercise control capabilities integrated with range control functions. Without an established exercise control function, units will experience differing levels of control effectiveness. The Marine Corps RM/T program continues to analyze and address these shortfalls through range investments consistent with available resources.
Collective Ranges	Unit Level Training	●	See comments regarding land, airspace, range control, target, and scoring deficits. Units have limited opportunities to conduct more complex training integrating maneuver with the employment of organic weapons and combined arms fires. The Marine Corps RM/T program continues to analyze and address these shortfalls through range investments consistent with available resources.
	MEU Level Training	●	Same as above.
MOUT Facilities	Unit Level Training	●	Numerous small MOUT facilities have received focused attention throughout the Marine Corps resulting in significant improvements; however, deficiencies remain. The small MOUTs generally support platoon and below level training. For company and battalion level training, the MOUT facilities on base are much smaller than areas they might have to operate during contingency or combat operations. The RM/T program is continuing to analyze and address shortfalls through range investments consistent with available resources.
	MEU Level Training	●	Camp Pendleton does not have an expansive MOUT facility, as identified in MCRP 3-0C, to support MEU operations. The MEUs conducting MOUT training at the base are forced to train in facilities that are significantly smaller and less complicated than areas they might have to operate during contingency operations while on deployment. RM/T program is continuing to analyze and address shortfalls through range investments consistent with available resources.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Individual Level Training	●	Intense competition and pressure from commercial and general aviation for access to and use of airspace in the critically overcrowded, Southern California coastal airspace corridors threatens to impact military aviation (manned and unmanned) and live fire operations in ranges and training areas. These concerns are addressed in inter-agency dialogue with the FAA.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Climate Impacts	Individual Level Training	●	Precipitation and heavy rain events cause damage to range and training area access roads resulting in degradation and impassable conditions. Likewise, wildland fires also set conditions for follow-on seasonal wet weather conditions and degradation. Access to the RTAs become restricted due to flooding and direct weather impacts to the training facilities and range access roads due to inability for not only training traffic to access the RTAs but for range control personnel and first responders. Areas are assessed, prioritized, and addressed based on available resources, personnel, and contracting resources available.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.

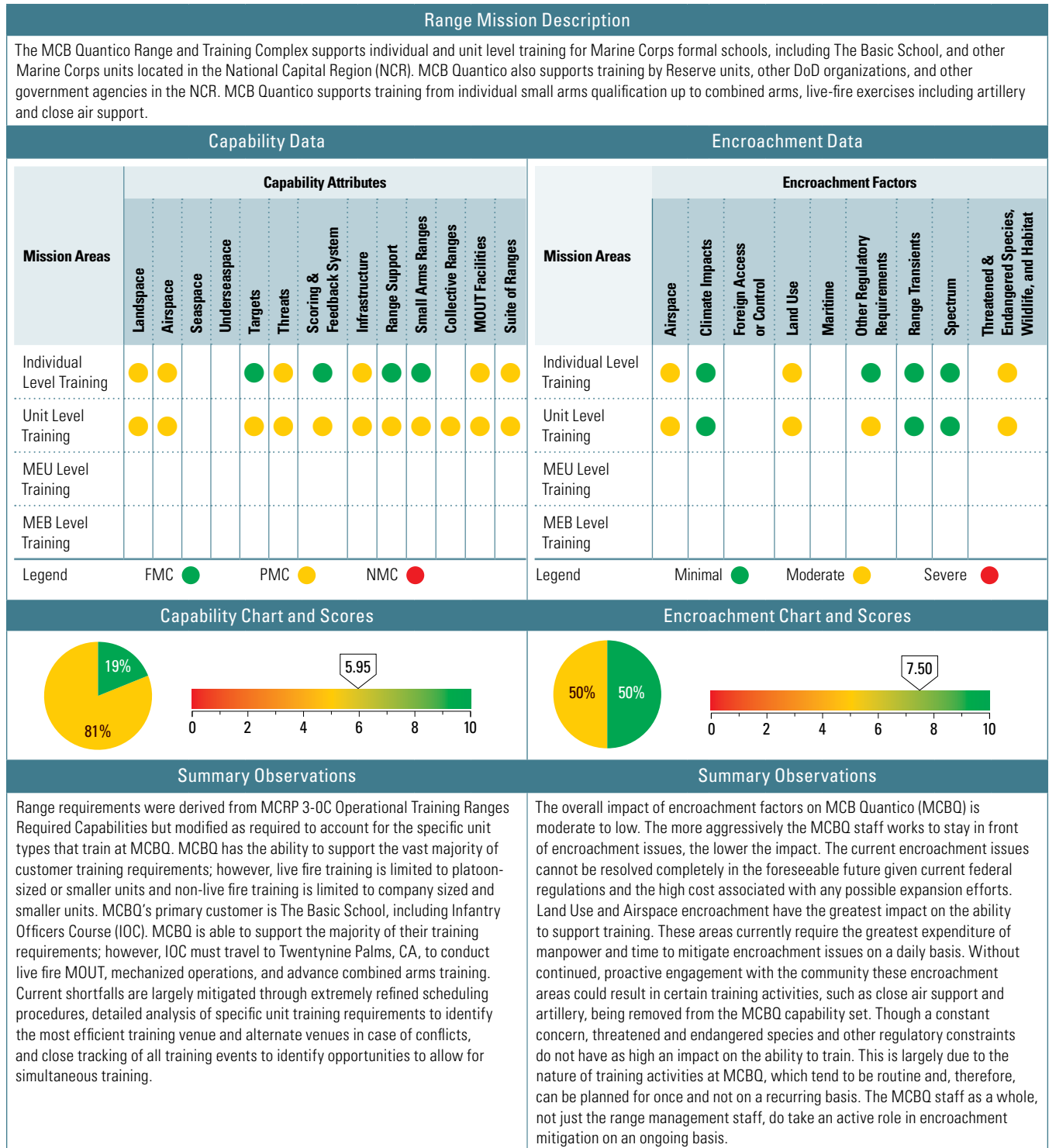
MCB Camp Pendleton Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Land Use	Individual Level Training	●	High density urban infrastructure contiguous to MCB Camp Pendleton inhibits the ability to train and constrains training in some areas due to noise and light considerations. Urbanization of the region puts pressure on off-installation natural resources (including sensitive and ESA-listed species), potentially increasing the base's share of remaining regional resources with increased management constraints affecting training. Regional growth affects access to off-installation lands for training, and inhibits NVG training by aircraft crews when transiting from offshore littoral areas to other training areas or installations within the region. Base lands are encumbered by long-term leasing out grants to the State of CA and a nuclear power plant facility. In addition, Trestles, a part of the leased San Onofre State Beach, is in the process of being nominated to the National Historic Register. These impacts reduce training effectiveness and tend to segment training exercises. Initiatives to reclaim training land formerly used for agricultural leases have been executed, and the process to return portions of the San Onofre Nuclear Power plant landspace is also underway. Relief is being sought through the REPI Program as well as continued community liaison and outreach.
	Unit Level Training	●	Same as above. Location of Interstate 5 and the railroad tracks preclude NSFS training or external load ship-to-shore aviation support training.
	MEU Level Training	●	Same as above.
Other Regulatory Requirements	Individual Level Training	●	Cultural resources constrain training due to their presence within the RTAs, which results in the inability to conduct routine ground disturbance associated with the training activity such as emplacing mortars or artillery. These constraints are cumulative with other limitations such as ESA-based restrictions, which limit training flexibility and realism. The anticipated nomination of Trestles to the Historic Register may reduce training effectiveness and segment training exercises. There is no remedy at this time.
	Unit Level Training	●	Same as above. Impacts on training from cultural resource constraints are more severe for complex unit-level and MEU-level training.
	MEU Level Training	●	Same as above.
Spectrum	Individual Level Training	●	Competition for access to and use of frequency spectrum has resulted in moderate to severe impacts on some training activities, including training requiring use of satellite communications frequencies, and training with UAS. In some instances, the U.S. Government is making portions of the frequency spectrum currently controlled by DoD available to the public and commercial activities. Spectrum restrictions can limit the number of units conducting UAS operations, which can in turn reduce training opportunities for individuals. The Marine Corps as well as DoD addresses this problem at the Service and Department level.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above, with greater impacts during MEU-level training exercises, which include much satellite communication.
Threatened & Endangered Species, Wildlife, and Habitat	Individual Level Training	●	Constraints on training due to presence of multiple ESA-listed species impacts the ability for forces to utilize the RTAs on a consistent basis. Species related training restrictions limit training realism and tend to segment training events; in some cases, restrictions may ingrain bad habits, such as not digging when in a defensive position. The base coordinates and consults extensively with the USFWS, with the objective of reducing constraints on training resulting from application of ESA. Despite these consultations all training restriction cannot be removed. For example, of the base's seventeen miles of coastline a significant amount is impacted by difficult topography, various leases, and seasonal restrictions for T&E species. Just north and adjacent to Blue Beach is the 4.32 mile stretch of White Beach of which 2.2 miles is also encumbered by the "Estuarine and Beach Ecosystem Conservation Plan", which affects traversing by amphibious vehicles, with the remaining 2.12 miles available to amphibious training from September 1 to February 14 (outside of the migratory bird breeding season). During the breeding season (February 15 to August 31) vehicles have to traverse the beach as previously mentioned. Training restrictions and workarounds are implemented to make accommodations during the breeding season for aircraft and ground vehicles.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

MCB Quantico Assessment Details



MCB Quantico Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	6.43	6.43	6.67	6.11	6.11	5.28	Encroachment Scores	9.09	9.09	7.27	7.27	7.27	8.64
<p>The overall capability score has increased for MCBQ due to improvements in three areas: Scoring and Feedback Systems, Range Support, and Small Arms Ranges. Scoring and Feedback Systems saw an improved score in the Individual Level Training category due to a reassessment of available data. MCBQ is able to provide effective scoring and feedback based on the Individual Training Standards. The current scoring and feedback systems are often archaic and require more manual effort than desired, but they meet the required standards. MCBQ will continue to pursue more advanced scoring and feedback capabilities in order to improve feedback quality and reduce logistical and time burdens on training units. Range Support experienced an increased rating in the Individual Level Training category due to HQMC investments to improve and better integrate range control facility systems and technology. MCBQ is able to more quickly and effectively schedule, review, track, record, and report on training activities in the RTA as a result of these significant investments. Small Arms Ranges increased in rating under the Individual Level Training category due to range development projects, purchase of additional targets, and adjustments to range SOPs that effectively increased the number of ranges capable of supporting individual level small arms live fire training. This has been a relatively low cost way to increase range capabilities. Though MCBQ will continue to pursue efforts to improve the various deficient capabilities through short-, mid-, and long-range efforts, two areas are particularly insolvable: Landspace and Airspace. Given the rapid growth of the surrounding Northern Virginia communities there is little land available for possible expansion and any expansion into those areas would be cost prohibitive. Regional growth has also led to an increase in civil use of surrounding airspace which makes expansion of MCBQ SUA nearly impossible to achieve. MCBQ must continue to look for ways to increase the efficient utilization of existing landspace and airspace to mitigate limitations, but will not be able to resolve those limitations in the foreseeable future.</p>							<p>The encroachment factors for CY2018 changed significantly from previous years, making it impossible to provide a direct comparison of the CY2018 overall encroachment rating with the ratings from previous years. Encroachment pressure on the whole installation is largely steady with the notable exception of additional threatened species being identified which have added additional constraints to some range development efforts. Overall, encroachment pressure is not expected to change in future years barring any significant changes in federal regulation or significant environmental changes. This steady state assumes that the MCBQ staff continues its proactive efforts to mitigate and prevent land and airspace encroachment.</p>						

MCB Quantico Assessment Details

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Individual Level Training	●	MCBQ does not have sufficient landspace to support all live and non-live training without creating conflicts and overlapping SDZs. A significant portion of maneuver area also serves as non-dud impact area and is therefore not available when live fire is in progress. Additionally, some ranges are within the SDZs of other ranges, so not all ranges can be used simultaneously. Non-live fire training is routinely shifted into less than optimal training area to accommodate higher priority live fire training which reduces training effectiveness. Live fire training units are sometimes shifted to alternate ranges to accomplish training reducing the quality of training. Units must often reroute troop and logistical movements in support of training to avoid live fire SDZs which increases training time and cost. The landspace shortfall cannot be solved without acquisition of additional property; however, landspace shortfalls can be mitigated through efficient scheduling and detailed tracking of units in real time.
	Unit Level Training	●	Same as above but with a greater negative impact due to the expanded amount of landspace required for Unit Level Training.
Airspace	Individual Level Training	●	MCBQ has only 10,000 feet AGL of restricted airspace and the horizontal limits of all SUA are very limited. Also, a majority of the MCBQ airspace is within the Washington, D.C.015 Special Flight Rules Area. Artillery is unable to conduct high angle fire due to the limited height of restricted airspace. Fixed-wing closer air support aircraft and V-22 transports are highly constrained in their operations due to the limited horizontal airspace. All aircraft operating in the MCBQ airspace must comply with SFRA rules which adds another layer of compliance requirements from the pilots and range control personnel. MCBQ is currently working to identify new gun positions to enable artillery to conduct high angle fire. Expansion or adjustment to the horizontal limits of the airspace can only be resolved through detailed negotiations with the FAA and, given the proximity of the MCBQ airspace to the Dulles airport, this would be an especially difficult adjustment to make. The SFRA area cannot be changed due to national security requirements.
	Unit Level Training	●	Same as above.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

MCB Quantico Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Targets	Unit Level Training	●	MCBQ does not have sufficient stationary and moving targets to support company level and higher live fire training. MCBQ also does not have enough or the appropriate type of aviation targets for close air support training. MCBQ can support live fire training only up to the platoon level. CAS training is limited to attacks on two fixed targets which does not provide effective training to pilots or tactical air controllers. MCBQ has a plan to develop a company live fire training capability. Procurement of additional targets will be included in the range development plan. New CAS targets are currently being procured; but even with new targets, MCBQ will not be able to meet doctrinal goals for aviation targets due to landspace constraints.
Threats	Individual Level Training	●	MCBQ does not have target sets that present as OPFOR and targets are not arrayed in any tactical OPFOR formation. MCBQ also has no capability to present OPFOR in non-live fire training. Personnel are not able train aboard MCBQ to counter specific OPFOR capabilities. For live fire, personnel train with generic target sets or must travel to other installations that do have OPFOR capable target systems. For non-live fire training, units must create OPFOR from organic assets or contract for OPFOR capability. Threat presentation will be incorporated in future range development projects and target procurement efforts.
	Unit Level Training	●	Same as above.
Scoring & Feedback System	Unit Level Training	●	MCBQ live fire target systems provide basic level scoring and feedback but do not provide any type of “shootback” capability to notify training personnel when fires are ineffective. For non-live fire training, MCBQ has a shortfall in the number of sets of tactical engagement systems. Training personnel do not receive real time feedback on the effectiveness of their fires reducing training realism. Non-live fire feedback equipment must be de-issued and re-issued on multiple occasions to ensure enough sets are available for critical training which reduces time available for training and increases logistical costs. MCBQ will continue to work to procure advanced target systems as they become available. Initiatives are underway to redistribute and, if possible, procure additional sets of non-live fire tactical engagement systems to support ongoing training requirements.
Infrastructure	Individual Level Training	●	The Calvin A Lloyd Range Complex is where all entry level and sustainment known distance rifle and pistol training occurs at MCBQ. The complex was designed and built to support WWII-era training requirements and is no longer sufficient to meet modern entry level training requirements. Safety issues prevent simultaneous use of several ranges except with significant restrictions in place, which reduces throughput and increases logistical and personnel costs to ensure proper safety. A master plan is being developed as part of the next MCBQ RCMP in order to begin addressing the modernization and transformation requirements of this range complex.
	Unit Level Training	●	Lack of sufficient internal road/trail network requires units to transport personnel, weapons and ammunition off-base on high use public roads to reach some ranges. Off base transit to ranges increases logistical costs and presents an ongoing safety issue for both military personnel and the civilian population. MCBQ is currently working on construction of a new trail system to enable access to all ranges without going off base.
Range Support	Unit Level Training	●	MCBQ does not support a dedicated exercise control network. Additionally, MCBQ does not have a system for electronically tracking units in the field. Units must provide their own exercise control network using organic assets. Units can only be tracked through verbal reports over the range control safety network which reduces accuracy and does not allow for maximum efficiency in landspace utilization. MCBQ will continue to pursue new technology to better track and coordinate units across the ranges and training areas.
Small Arms Ranges	Unit Level Training	●	MCBQ does not have an adequate long range sniper range despite hosting the Marine Corps’ Advanced Scout Sniper Course. Units must provide their own exercise control network using organic assets. Units can only be tracked through verbal reports over the range control safety network which reduces accuracy and therefore does not allow for maximum efficiency in landspace utilization. MCBQ will continue to pursue new technology to better track and coordinate units across the ranges and training areas.
Collective Ranges	Unit Level Training	●	MCBQ cannot support company sized or larger live fire exercises due to current range limitations. Larger units training aboard MCBQ must limit live fire training to platoon and smaller sized units which increases training time and limits achievable training objectives. The MCBQ RCMP currently in development will establish a plan to create a company live fire capability.
MOUT Facilities	Individual Level Training	●	MCBQ does not have adequate live fire MOUT training facilities. Units required to train in live fire MOUT must limit themselves to team size exercises which severely impacts throughput for individual level training and prevents training at squad size or larger for unit training. Units must travel to other locations to conduct live fire MOUT training. The MCBQ RCMP currently in development will establish a plan to develop a more robust live fire MOUT training facility.
	Unit Level Training	●	Same as above.

MCB Quantico Detailed Comments

Capability Observations

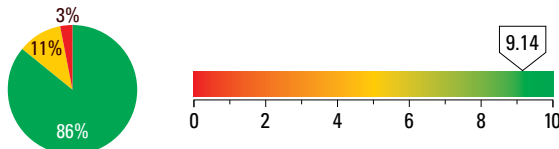
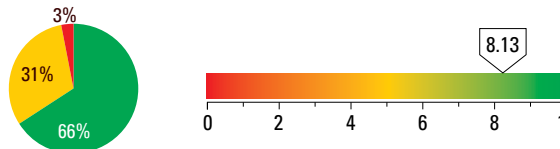
Attributes	Assigned Training Mission	Score	Comments
Suite of Ranges	Individual Level Training	●	MCBQ is deficient on its suite of individual-level ranges because it lacks an automated sniper range, an automated multi-purpose machinegun range, an automated grenade launcher range, a 40mm machine gun qualification range and a MOUT assault course range. Entry level personnel are not able to train to standard on all individual training tasks but must fire modified courses of fire to accomplish training on MCBQ. The MCBQ RCMP currently in development will establish a plan to develop these capabilities within the constraints of limited landscape. Where possible, MCBQ will look to new target systems to replicate required capabilities on existing ranges.
	Unit Level Training	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Individual Level Training	●	MCBQ restricted airspace only extends to 10,000 feet AGL and the MCBQ Military Operations Area does not have enough horizontal or vertical space to support realistic fixed wing CAS and V-22 flight profile training; future aircraft will be even further limited. Encroachment from neighboring regional airports are trying to expand their airfield capabilities, Dulles Airport's increasing need to route aircraft over MCBQ SUA, and the establishment of the Special Flight Rules Area for Washington, D.C. all prevent further expansion and place pressure to actually reduce the size and use of the SUA. Fixed wing CAS training is limited to aircraft taking a single run in approach to attack one of two closely spaced air targets, limiting the training value to both the pilots and the ground personnel calling for supporting arms. V-22 pilots cannot effectively train to standards, and units utilizing V-22s must often make administrative approaches to landing zones instead of full profile tactical approaches. This may not be a solvable issue. Initial research will be conducted to determine if the existing SUA can be expanded or adjusted to better accommodate current military training requirements without negative impact on other airspace users. MCBQ has taken an active stance in resisting any further encroachment on existing SUA.
	Unit Level Training	●	Same as above.
Land Use	Individual Level Training	●	MCBQ landscape is constrained by the surrounding civilian community which continues to see a steady expansion in residential and commercial building. Additionally, MCBQ experiences ongoing pressure for on-base expansion into the current RTA due to MCBQ's close proximity to Washington, D.C. and the desire by USMC organizations, other DoD activities, and other government agencies to establish facilities on federal property within commuting distance to DC. Off-base encroachment results in increased noise complaints and has potential to limit activities such as live CAS and artillery training due to incompatible land use development. On-base encroachment leads to reduced overall available RTA landscape as well as the compartmentalization of RTA around new development making it less usable for training purposes. MCBQ has established strong lines of communication and coordination with neighboring counties to limit growth where possible and to more effectively communicate the nature and purpose of training to minimize complaints. MCBQ has also instituted non-RTA growth limits in the Installation Master Plan to prevent continued internal encroachment. Both efforts require continued attention to prevent future additional problems but do not eliminate existing issues.
	Unit Level Training	●	Same as above.
Other Regulatory Requirements	Unit Level Training	●	Wetlands and cultural resource locations limit where certain training activities can occur. Training in mechanized/ motorized convoy operations and deliberate defense construction are restricted. Detailed coordination must be made with the Environmental Office for any deviations to existing restrictions. This increases planning timelines for training and reduces overall realism of training. MCBQ is working to expand the number of areas available for these types of training activity but restrictions cannot be lifted entirely given current federal regulations. These regulatory requirements do apply to Individual Level Training (ILT) as well but given the structured nature of ILT, training can more easily be scheduled outside restricted areas without impacting the lead time required or quality of training.
Threatened & Endangered Species, Wildlife, and Habitat	Individual Level Training	●	Several threatened or endangered flora and fauna species do exist on MCBQ. Though generally localized to specific areas or limited to specific time frames, the presence of these species does limit the types of training that can occur in specific areas and restricts the ability to accomplish RTA maintenance, sustainment, and redevelopment projects. Detailed coordination must be made with the Environmental Office for any training activities that might impact threatened and endangered species. This increases training planning timelines and leads to artificial training constraints. Range development projects require species specific surveys which can only be conducted during narrow time windows when the species present themselves. This adds cost and time to nearly all range projects. MCBQ conducts detailed internal coordination to limit the impacts of threatened and endangered species to the maximum extent possible but restrictions cannot be lifted entirely given current federal regulations.
	Unit Level Training	●	Same as above.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

MCAGCC Twentynine Palms Assessment Details

Range Mission Description																								
The Marine Corps Air Ground Combat Center (MCAGCC) provides range capabilities to support training of Marines, Marine Corps units, MAGTF elements, and MAGTFs in the mission essential tasks of modern expeditionary warfare, including Service-directed pre-deployment training exercises and training of units of the First Marine Expeditionary Force (I MEF) that are assigned to the installation. The Marine Air Ground Task Force Training Command (MAGTFTC) maintains its headquarters at MCAGCC.																								
Capability Data												Encroachment Data												
Mission Areas	Capability Attributes											Mission Areas	Encroachment Factors											
	Landpace	Airspace	Seaspace	Underseaspace	Targets	Threats	Scoring & Feedback System	Infrastructure	Range Support	Small Arms Ranges	Collective Ranges		MOUT Facilities	Suite of Ranges	Airspace	Climate Impacts	Foreign Access or Control	Land Use	Maritime	Other Regulatory Requirements	Range Transients	Spectrum	Threatened & Endangered Species, Wildlife, and Habitat	
	Individual Level Training	●	●			●	●	●	●	●				●	Individual Level Training	●	●	●	●		●	●	●	●
	Unit Level Training	●	●			●	●	●	●	●				●	Unit Level Training	●	●	●	●		●	●	●	●
	MEU Level Training	●	●			●	●	●	●	●				●	MEU Level Training	●	●	●	●		●	●	●	●
MEB Level Training	●	●			●	●	●	●	●			●	MEB Level Training	●	●	●	●		●	●	●	●		
Legend FMC ● PMC ● NMC ●												Legend Minimal ● Moderate ● Severe ●												
Capability Chart and Scores												Encroachment Chart and Scores												
																								
Summary Observations												Summary Observations												
Doctrinal range requirements are derived from Operational Training Ranges Required Capabilities (MCRP 3-0C). MEB-level training will be assessed after MEB-level training occurs. Deficits noted in available training land and airspace impact the ability to conduct required Service-level training of large Marine Air Ground Task Forces (MAGTFs). The land and airspace expansion initiative is expected to significantly enhance range complex for MAGTF training.												The references for this assessment are Operational Training Ranges Required Capabilities (MCRP 3-0C) and RCMP. Twenty-five percent of the range/ range complex mission is moderately impacted by encroachment. Spectrum, Airspace, and Threatened & Endangered Species are the encroachment factors moderately impacting the training mission and impacts all levels of training. The Encroachment Control Plan (ECP) has been completed and is being executed.												
Historical Information, Results, and Future Projections												Historical Information, Results, and Future Projections												
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015											
Capability Scores	5.63	5.63	6.03	6.03	6.03	8.57	Encroachment Scores	9.00	9.00	9.10	9.10	9.10	9.10											
Impacts from key range capabilities shortcomings resulted in PMC designations for this installation during FY2015-FY2018 when assessing the installation’s ability to support Marine Corps Task 1.7 (Provide Range and Training Areas that Support Operating Forces’ Fire and Maneuver Training METs). The top three capabilities and/or enhancements required to facilitate transition to FMC include MEB level combined arms live fire and maneuver training capability, exercise command and control battle staff training capability, and airspace expansion.												Impacts from key encroachment factors resulted in PMC designations for this installation during FY2016-FY2018 when assessing the installation’s ability to support Marine Corps Task 1.7 (Provide Range and Training Areas that Support Operating Forces’ Fire and Maneuver Training METs). Successful mitigation of key encroachment factors; including airspace restrictions, frequency spectrum limitations, and threatened and endangered species; are required to facilitate transition to a FMC designation.												

MCAGCC Twentynine Palms Detailed Comments

Capability Observations

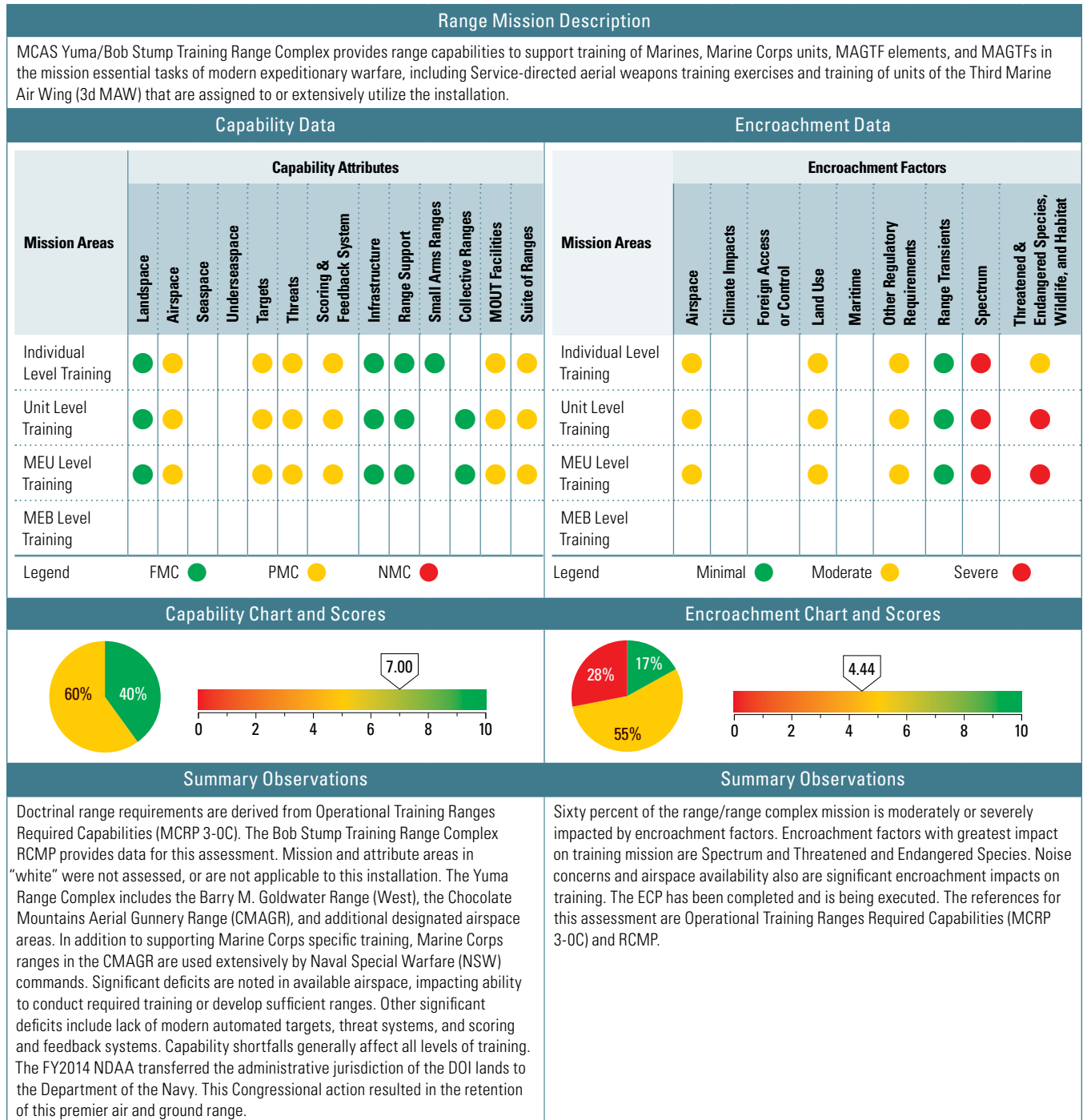
Attributes	Assigned Training Mission	Score	Comments
Airspace	MEU Level Training	●	An airspace expansion initiative is improving capability, but remaining deficiencies do not support MEU level training.
	MEB Level Training	●	There is a current requirement for airspace in support of the Johnson Valley land acquisition initiative. The installation is unable to conduct training without required airspace. TSUA airspace proposals submitted to FAA for LSE-17. PSUA to be submitted after lessons learned from LSE-17.
Threats	MEB Level Training	●	Additional required threat assets have not been programmed to support operations on new lands. Permanent airspace negotiations over newly acquired lands are pending. The newly acquired lands are only available for non live fire activities. Temporary SUA is negotiated in support of the Large Scale Exercise (MEB) only. A Controlled Firing Area proposal is being submitted in the interim to support ground live fire only pending permanent airspace assignment. In the interim, the range will use the current inventory of threat assets to support scheduled training.
Scoring & Feedback System	MEB Level Training	●	Additional required threat assets have not been programmed to support operations on new lands. Permanent airspace negotiations over newly acquired lands are pending. The newly acquired lands are only available for non live fire activities. Temporary SUA is negotiated in support of the Large Scale Exercise (MEB) only. A Controlled Firing Area proposal is being submitted in the interim to support ground live fire only pending permanent airspace assignment. In the interim, the range will use the current inventory of threat assets to support scheduled training.
Infrastructure	MEB Level Training	●	There is a combined exercise control facility but it is insufficient for large-scale MAGTF and joint exercises. A MILCON project has been submitted, but does not compete well in the MILCON prioritization.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	MEU Level Training	●	Congested regional airspace surrounds SUA supporting MCAGCC ranges, resulting in FAA pressure for access to SUA. Interruptions and modifications of training result in capabilities of fixed wing aviation assets to ingress/egress in tactical profiles over range areas. An initiative to expand airspace access is ongoing. USMC is in coordination with FAA in the context of land expansion. There is a TSUA proposal pending with FAA for LSE-17. A previous PSUA proposal was non-concurred by FAA. The PSUA proposal to be submitted after lessons learned from LSE-17.
	MEB Level Training	●	Same as above.
Land Use	MEB Level Training	●	BLM land has been acquired, but requires tortoise translocation (pending completion in fall 2017). The USMC still needs to acquire remaining private parcels and mines. MEB-level training remains constrained until these actions have been completed. MEB-level training will be conducted within the previous MCAGCC boundaries until actions complete.
Spectrum	Individual Level Training	●	Congested spectrum limits frequency availability/deconfliction. This affects all levels of training through frequency spectrum interference. The installation is implementing assessment and mitigation planning actions and milestones. The CPIB Chairman recently approved the MAGTFTC MCAGC RTAA C2 Systems D-UNS #15286DA. CD&I is attempting to add funding to FY2019. A decision is also pending on COAs to support communication in expansion areas.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
	MEB Level Training	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Individual Level Training	●	Training in newly acquired lands cannot commence before tortoise translocation, which began in spring 2017 after the SEIS was completed; the translocation is expected to be completed in fall 2017.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
	MEB Level Training	●	Same as above.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

MCAS Yuma/Bob Stump Assessment Details



MCAS Yuma/Bob Stump Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	5.28	5.28	6.67	6.67	6.67	7.22	Encroachment Scores	5.25	5.25	6.17	6.17	6.17	6.17
Impacts from key range capabilities shortcomings resulted in “Partially Mission Capable” designations for this installation during FY2015–FY2018 when assessing the installation’s ability to support Marine Corps Task 1.7 (Provide Range and Training Areas that Support Operating Forces’ Fire and Maneuver Training METs). Top three capabilities and/or enhancements required to facilitate transition to “Fully Mission Capable” include available airspace, modern automated targets, and scoring and feedback systems.							Impacts from key encroachment factors resulted in “Partially Mission Capable” designations for this installation during FY2015–FY2018 when assessing the installation’s ability to support Marine Corps Task 1.7 (Provide Range and Training Areas that Support Operating Forces’ Fire and Maneuver Training METs). Successful mitigation of key encroachment factors; including spectrum, threatened and endangered species, and noise restrictions and adjacent land use; are required to facilitate transition to a “Fully Mission Capable” designation.						

MCAS Yuma/Bob Stump Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Airspace	Individual Level Training	●	Airspace requirements for individual training are fully met within the range complex with the exception of the objective requirement of 30 NM x 60 NM for EW ranges. Current airspace within R 2301W is inadequate to support all F-35 training requirements at the squadron level. Efforts are ongoing with regard to combining R 2301W and E.UAS. Airspace-related challenges persist in supporting the dynamics associated with the evolution of UAS. Current airspace appears to be meeting all identified requirements; however, current ULT requires standalone airspace blocks for extended periods of time.
	Unit Level Training	●	The objective requirement for a 40 NM x 60 NM AAW and 30 NM x 60 NM EW range is not met within the range complex. The altitude blocks are not consistent causing the airspace to be fragmented. Airspace has limited availability to non-participating units during WTI, other Service-level pre-deployment training exercises, and unit detachments to MCAS Yuma. Efforts are ongoing to improve airspace scheduling and management to optimize airspace availability and utilization. Marine Corps is coordinating with FAA to provide enhanced airspace for larger training events. Also, MCAS Yuma is evaluating a potential MOA with Luke Air Force Base regarding use of R-2301E. Current airspace within R 2301W is inadequate to support all F-35 training requirements at the squadron level. Efforts are ongoing with regards to combining R 2301W and E.UAS. Airspace related challenges persist in supporting the dynamics associated with the evolution of UAS. Current airspace appears to be meeting all identified requirements; however, current ULT requires standalone airspace blocks for extended periods of time.
	MEU Level Training	●	Same as above.
Targets	Individual Level Training	●	The fidelity and quality of tactical targets are limited for training of aviation ground support units. The RM/T program is addressing shortfalls consistent with available resources. Planned upgrades include investment in welded and pop-up targets; buildings for convoy operations and enhanced marksmanship program (EMP) training.
	Unit Level Training	●	The type, quality, fidelity, and quantity of targets are inadequate. There is a limited number of JDAM targets. No targets with IR signature capability. Urban Close Air Support range (Yodaville) does not provide a realistic urban training environment for helicopter gunnery operations. The RM/T program is addressing shortfalls consistent with available resources.
	MEU Level Training	●	Same as above.
Threats	Individual Level Training	●	Shortfalls in threat aircraft include no rotary-wing threat aircraft, no aircraft with A-A radar missile presentations, and radar capability is limited on the F-5. Solutions or workarounds include units-in-training providing own OPFOR and joint training with USAF using F-15/16. Other shortfalls include threat Level 3 and 4 EC signature equipment and limited coverage of EW threat systems and OPFOR simulators beyond R-2301W. The RM/T program is addressing these shortfalls consistent with available resources. Efforts are ongoing to generate facilities that will support evolving cyber requirement. The intent is to construct a facility and turn it over to operational forces to utilize both air and ground assets to further refine cyber, counter-cyber, and standalone cyber awareness training.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.

Figure 3-18 Marine Corps Capability and Encroachment Assessment Detail (continued)

MCAS Yuma/Bob Stump Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Scoring & Feedback System	Individual Level Training	●	TACTS and EC&C coverage are limited to R-2301W. S-A threat simulations are limited. Tactical targets are not scored and there is no scoring feedback in R-2507. Debrief capability is limited to MCAS Yuma, MCAS Miramar, and NAF El Centro. Low altitude communication is limited. EC&C is limited to R-2301W and there are no secure EC&C circuits. RM/T program is addressing shortfalls consistent with available resources. Initiatives include investment in JNTC compliant tracking and EC&C equipment to cover entire range complex; staffing support for Range Operational Control Center (ROCC); upgrades for S-A simulations; scoring for tactical targets in R-2507N/S; upgrade TACTS to TCTS; and communications upgrade to resolve low altitude shortfall and shortage of secure communication circuits.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
MOUT Facilities	Individual Level Training	●	Development of new MOUT facilities has received focused attention throughout the USMC resulting in significant improvements; however, deficiencies remain. The RM/T program is continuing to address shortfalls consistent with available resources and Service priorities.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Suite of Ranges	Individual Level Training	●	USMC continues to support all SOCOM sponsored upgrades and enhancements within the CMAGR, allowing for ongoing and advance SPECOPS training at the Desert Warfare Training Facility located outside Nyland, California.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Individual Level Training	●	When FAA (LA Center) experiences significant weather issues, commercial air traffic sometimes is re-routed around or through MCAS controlled restricted airspace. The use of MCAS airspace is granted by MCAS through an existing letter of agreement (LOA) if not being utilized by scheduled military training. Aircraft ordnance takeoffs and recoveries are restricted to certain runways. As a shared use airfield, significant civilian aircraft operations often delay military aircraft takeoffs and require the military to extend the traffic pattern for proper spacing to land. Crop dusters operating within the tower's airspace are mitigated by flying normal course rules into and out of airfield for helos and are distracting. Power lines planned around base underlying Class D airspace impact instrument approach procedures.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Land Use	Individual Level Training	●	Supersonic flight is restricted to a corridor located in the R2301W and to only one direction inhibiting realistic training. Noise complaints stem from aircraft aligning to use targets in restricted areas that may be close to the borders of the area (R2301W/BMGR). Residential expansion towards the boundary of the range areas is also an issue. Low-level aircraft (helos) transiting to and from these areas have resulted in noise complaint issues as housing grows in the foothills area. MCAS Yuma's community liaison and outreach program seeks to influence community understanding of training and operational concerns.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Other Regulatory Requirements	Individual Level Training	●	Due to UXO presence, convoy security elements are not authorized to depart existing roads or trails which limits the realism of required training. Range clearance procedures mitigate impacts.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.

MCAS Yuma/Bob Stump Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Spectrum	Individual Level Training	●	MCAS Yuma is a joint military-civilian use airfield and significant civilian aircraft operations often crowd tower and approach frequencies. Civilian and military frequencies are separate; however, Air Traffic Control's response is often delayed to military aircraft due to communications with civilian traffic. Growth in regional communications infrastructure, including south of the border with Mexico, and new commercial cell phone towers increase noise floor levels and some of the systems operate in the same frequency bands as the equipment used by MCAS Yuma or tenant units. The ability to use the full spectrum of L-Band (D-Band) for AN/TPS-59 (V)3 radar system to include secondary radar (Identification Friend or Foe, specifically Mode-4 and Mode 5) is adversely effected. To date, Mode-4/5 cannot be used. Current impacts are manageable; however trends, including proposed broadband allocation initiatives, threaten to significantly impact training and daily airfield operations.
	Unit Level Training	●	Same as above.
	MEU Level Training	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Individual Level Training	●	Endangered species and habitat protection requirements result in significant challenges to effective training involving earthwork or heavy equipment operations. Range delays are encountered for some training activities involving high explosive ordnance. This is due to a requirement to physically inspect the ranges to ensure that no endangered wildlife species are occupying the area. MCAS Yuma maintains close coordination with USFWS to address ESA-based constraints on training.
	Unit Level Training	●	Same as above. Impacts are more significant for Unit- and MEU-Level Training.
	MEU Level Training	●	Same as above. Impacts are more significant for Unit- and MEU-Level Training.

Table 3-6 Marine Corps Capability and Encroachment Assessment Comparison

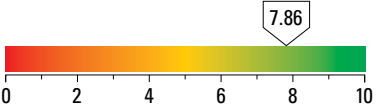
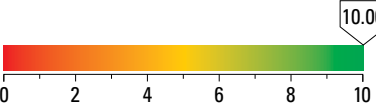
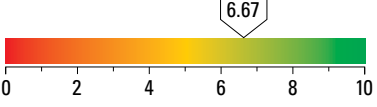
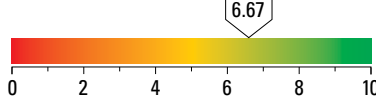

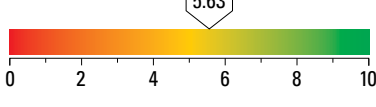
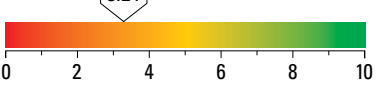
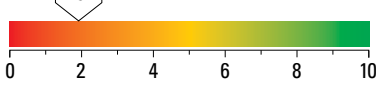
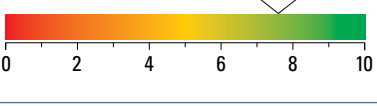
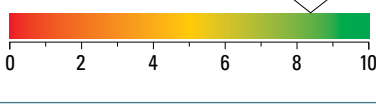
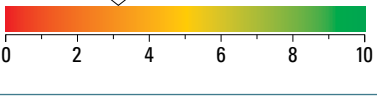
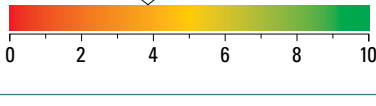
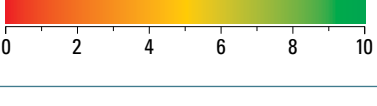
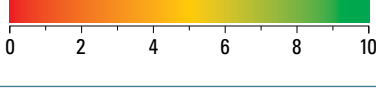
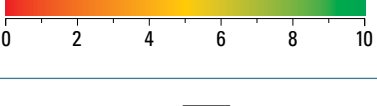
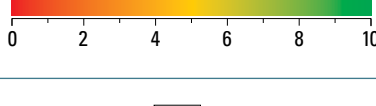
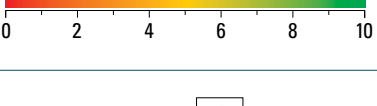
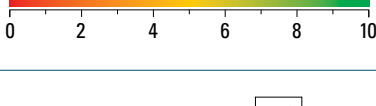
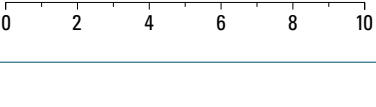
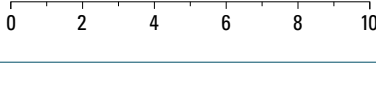
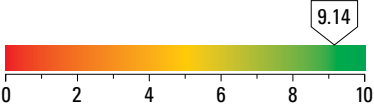
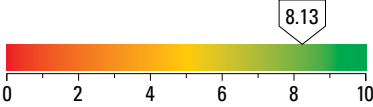
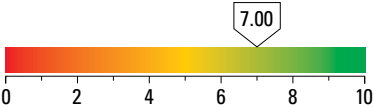
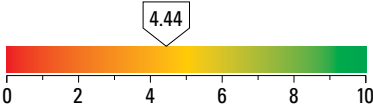
Range Name	Capability Score	Encroachment Score
MCAS Beaufort/ Townsend Bombing Range	 7.86	 10.00
MCLB Barstow	 6.67	 6.67
MCMWTC Bridgeport	 5.00	 5.63
MCIPAC-MCB Butler	 3.24	 1.94
MCAS Cherry Point	 7.63	 8.33
MCB Hawaii	 3.13	 3.85
MCB Camp Lejeune	 7.09	 7.19
MCAS Miramar (Camp Elliott)	 7.00	 8.57
MCB Camp Pendleton	 5.67	 4.76
MCB Quantico	 5.95	 7.50

Table 3-6 Marine Corps Capability and Encroachment Assessment Comparison (continued)

Range Name	Capability Score	Encroachment Score
MCAGCC Twentynine Palms		
MCAS Yuma/ Bob Stump		

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3.2.3 Navy Range Assessments

Table 3-7 Navy Capability Assessment Data Summary

Range	NMC	PMC	FMC	Capability Scores
Atlantic City	0	0	7	10.00
Atlantic Test Range (ATR) - Patuxent River	0	0	0	Not Assessed
Atlantic Undersea Test and Evaluation Center (AUTC)	0	2	32	9.71
Boston	0	2	12	9.29
China Lake	0	1	23	9.79
El Centro	0	25	6	5.97
Fallon	12	11	7	4.17
Gulf of Mexico (GOMEX)	0	0	29	10.00
Hawaii	5	21	41	7.69
Jacksonville	1	12	29	8.33
Japan	7	21	16	6.02
Key West	0	2	5	8.57
Mariana Islands	20	23	17	4.75
Narragansett	0	2	5	8.57
Navy Cherry Point	1	15	39	8.45
Northern California (NOCAL)	5	7	26	7.76
Northwest Training Range Complex	2	28	34	7.50
Okinawa	4	36	10	5.60
Point Mugu Sea Range	0	4	51	9.64
Southern California (SOCAL)	5	54	21	6.00
Virginia Capes (VACAPES)	1	18	39	8.28
HQ Navy	63	284	449	7.42

Table 3-8 Navy Encroachment Assessment Data Summary

Range	Severe	Moderate	Minimal	Encroachment Scores
Atlantic City	0	2	3	8.00
Atlantic Test Range (ATR)- Patuxent River	0	13	20	8.03
Atlantic Undersea Test and Evaluation Center (AUTC)	0	7	16	8.48
Boston	0	4	6	8.00
China Lake	0	19	17	7.36
El Centro	8	19	12	5.51
Fallon	13	11	12	4.86
Gulf of Mexico (GOMEX)	0	7	15	8.41
Hawaii	0	39	24	6.90
Jacksonville	0	18	13	7.10
Japan	0	9	20	8.45
Key West	0	2	3	8.00
Mariana Islands	1	35	34	7.36
Narragansett	0	2	3	8.00
Navy Cherry Point	0	12	23	8.29
Northern California (NOCAL)	0	2	26	9.64
Northwest Training Range Complex	1	24	37	7.90
Okinawa	0	16	24	8.00
Point Mugu Sea Range	3	24	2	4.83
Southern California (SOCAL)	0	53	22	6.47
Virginia Capes (VACAPES)	0	27	10	6.35
HQ Navy	26	345	342	7.22

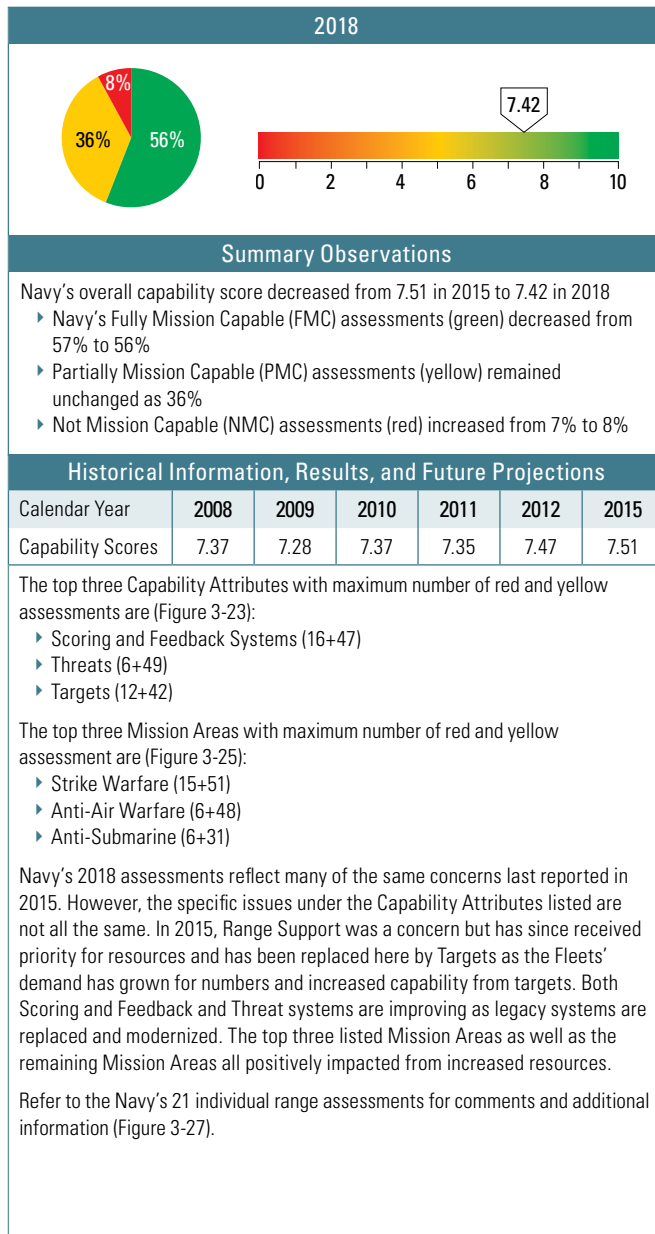
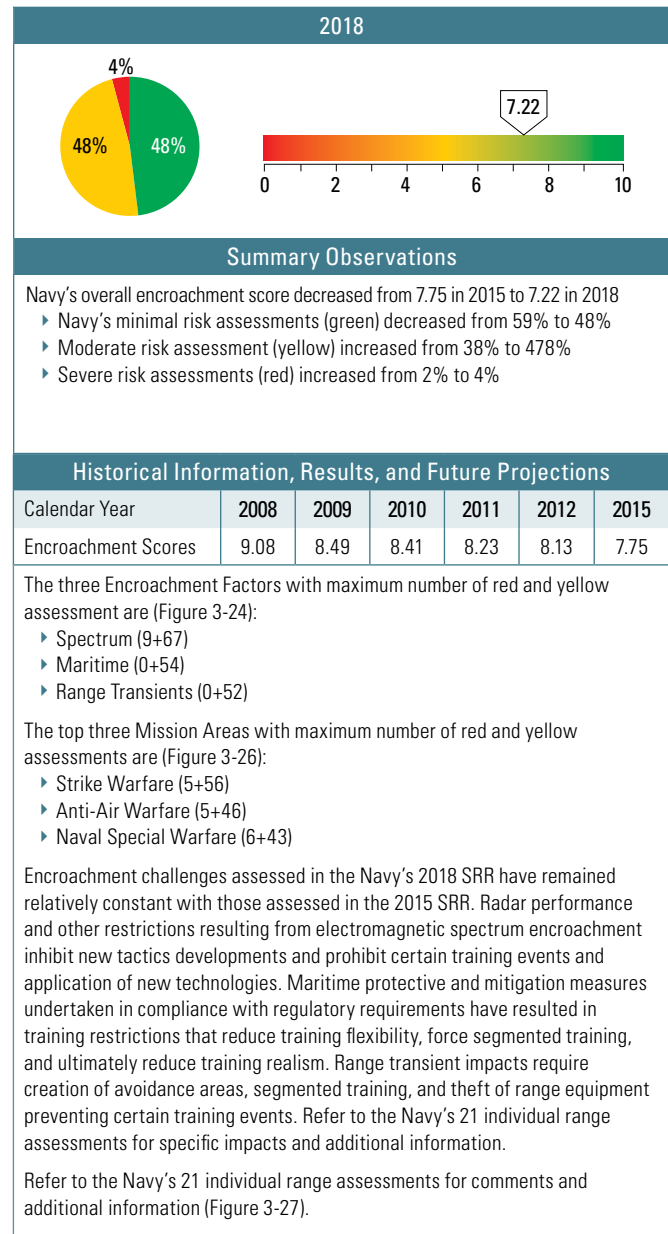
Figure 3-19 Navy Capability Chart and Scores**Figure 3-20 Navy Encroachment Chart and Scores**

Figure 3-21 Navy Capability Assessments by Range

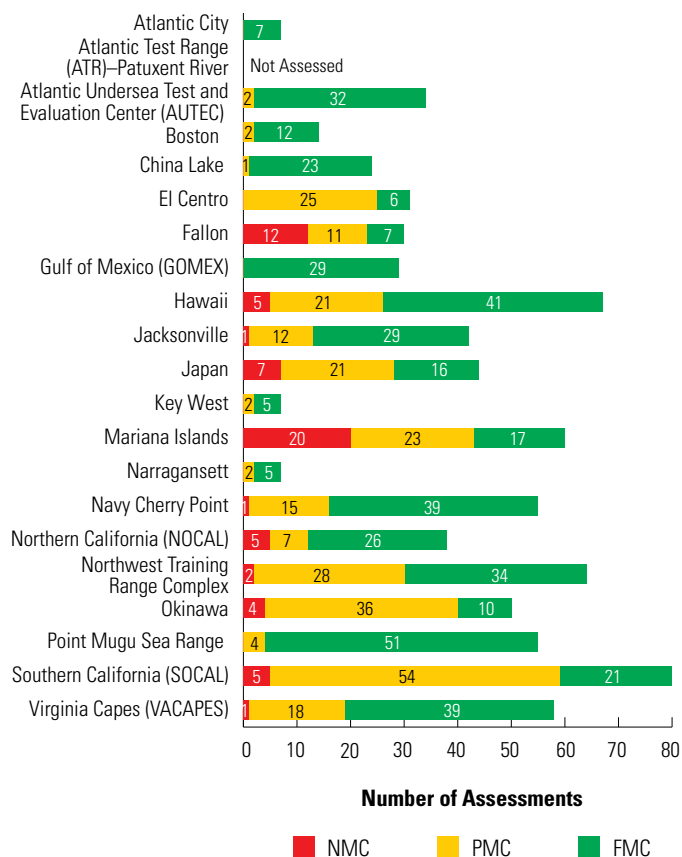


Figure 3-22 Navy Encroachment Assessments by Range

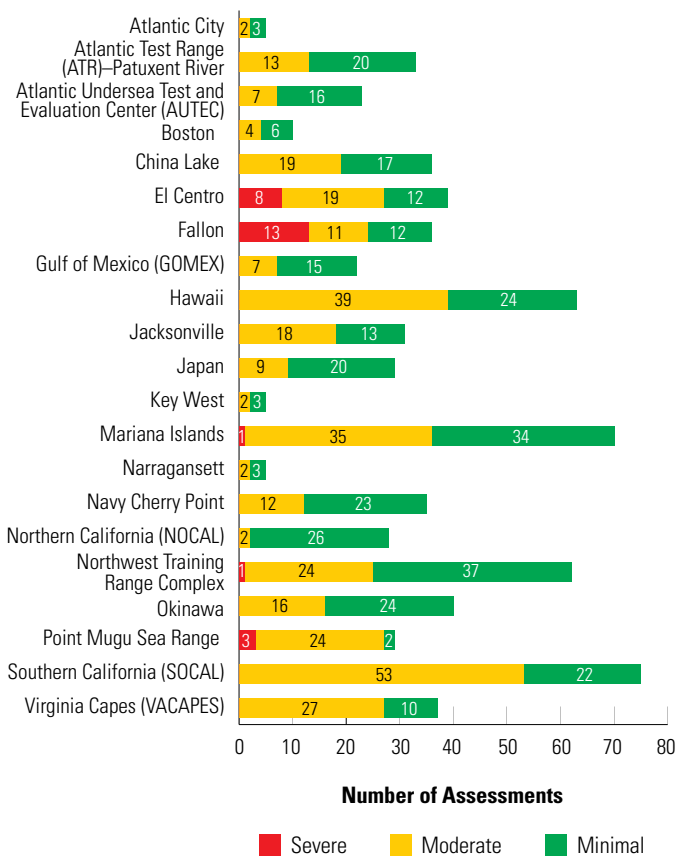


Figure 3-23 Navy Capability Assessment by Attributes

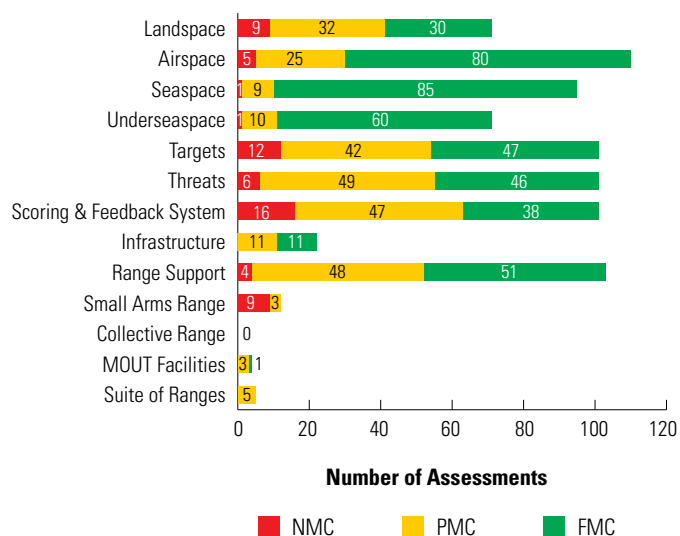


Figure 3-24 Navy Encroachment Assessment by Factors

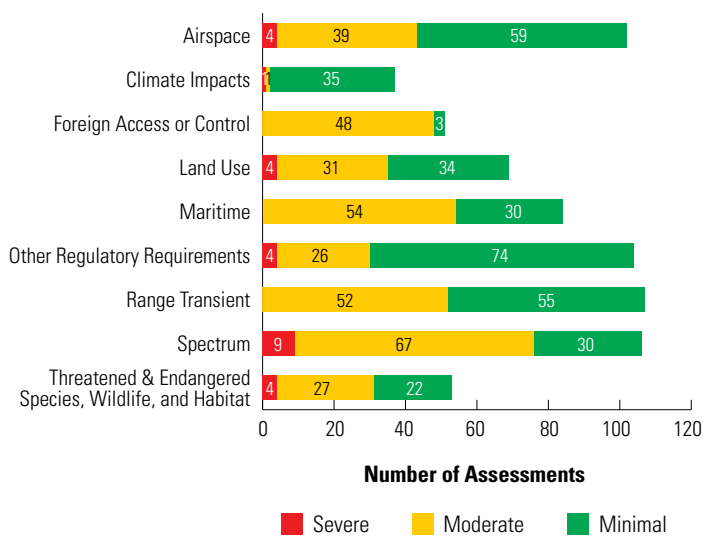


Figure 3-25 Navy Capability Assessment by Mission Areas

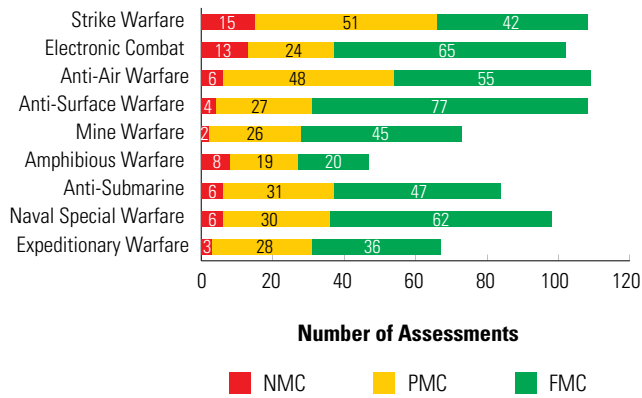


Figure 3-26 Navy Encroachment Assessment by Mission Areas

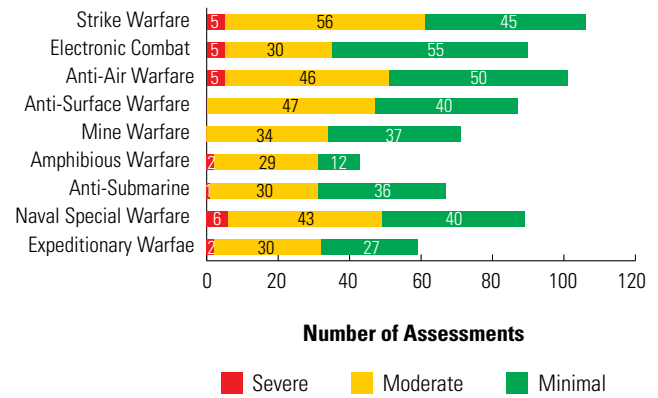
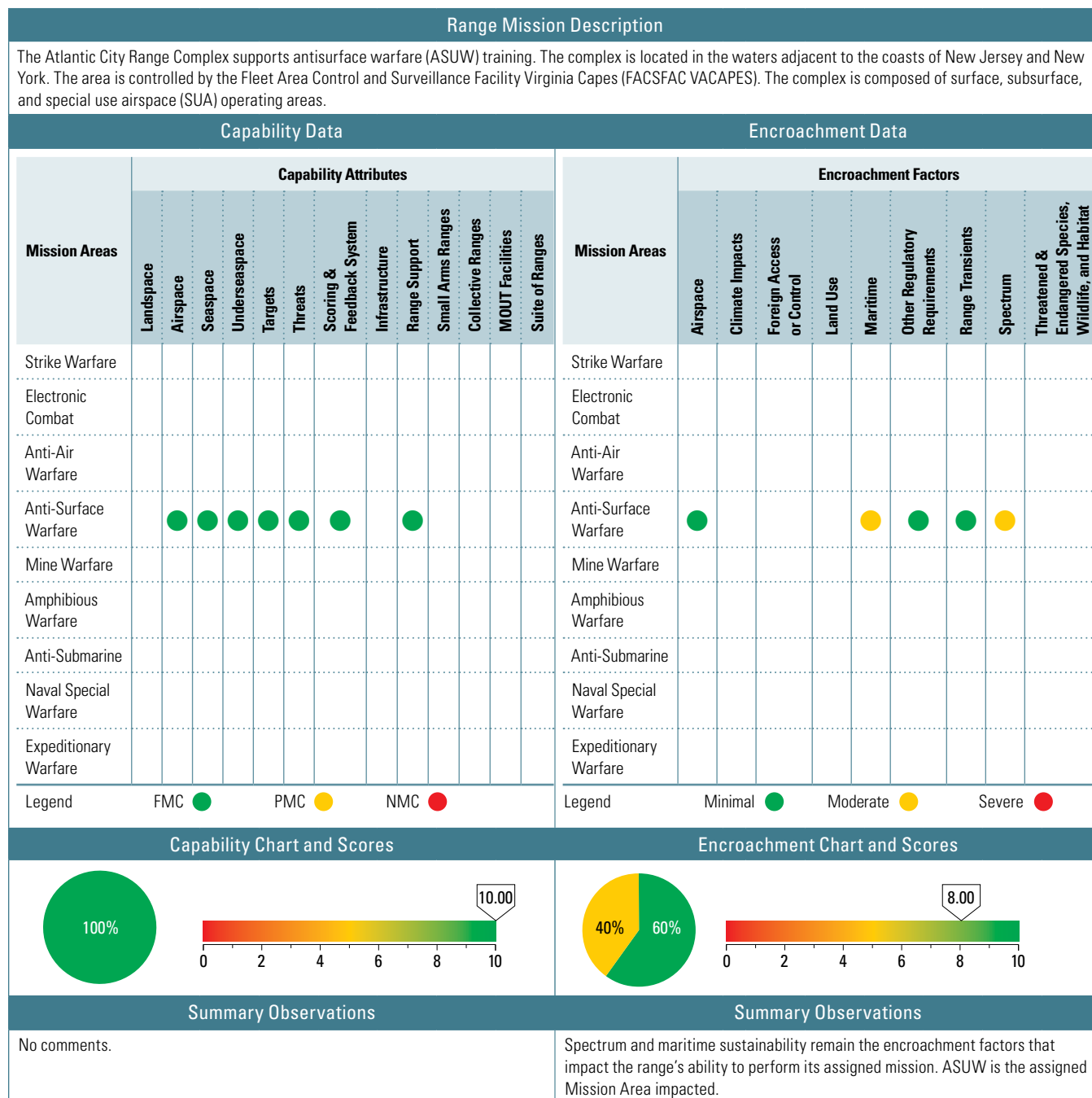


Figure 3-27 Navy Capability and Encroachment Assessment Detail

Atlantic City Assessment Details



Atlantic City Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	8.93	8.93	8.93	8.93	9.29	9.29	Encroachment Scores	8.75	8.33	8.33	8.33	8.33	8.33
<p>The capability assessment had been stable from year to year, with constant overall scores since a slight improvement in CY2012. In 2012, the anti-air warfare (AAW) mission area was deleted by USFF. The score increased in 2017 due to Range Support being graded as fully mission capable based on the use of a new web-based scheduling tool, DCAST (Data Collection and Scheduling Tool).</p>							<p>Encroachment assessments for CY2008 were different than for CY2009–2015. The algorithm for the overall assessment score for 2009–2015 was revised from the original algorithm used in 2008 to provide greater fidelity and consistency across all range complexes. Based on an improved review process and revised algorithms, the assessments for CY2009–2015 provide a more accurate assessment of encroachment. The assessments for the latter years reveal there has been little encroachment change from year to year, with relatively constant overall scores through to 2015. The overall encroachment score for CY2017 dropped slightly due to recent changes made to encroachment factors and definitions. Department of Interior (DOI) and private energy interests in the Outer Continental Shelf (OCS) are increasing as domestic energy demand builds. Naval offshore operating areas & training events may be affected. High priority areas include training ranges & sea space in and adjacent to all Navy OPAREAs. OASN (EI&E) continues to work closely with the Fleets & DOI's Bureau of Ocean Energy Management (BOEM) to resolve issues of combined use of the OCS important to both agencies. Fleet review & analysis of impacts from both oil/gas & wind energy "lease sale" areas offshore New Jersey have been reviewed and forwarded to OSD. DoD & DOI coordination continues. Expect an additional round of reviews later in CY2017. An emerging encroachment issue that may affect the Atlantic City Range Complex is increased commercial vessel traffic and port infrastructure expansion that could impact area access and surface maneuver. In addition, future deployment of Ocean Observing Systems (OOS) and shipboard / airborne scientific research events and activities may also impact ASUW training and submarine transit. The Northeast Encroachment Action Plan (EAP), including Atlantic City, was completed November 2015.</p>						

Atlantic City Detailed Comments

Capability Observations


Attributes	Assigned Training Mission	Score	Comments
No comments.			

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Maritime	Anti-Surface Warfare (ASUW)	●	<p>Maritime protective and mitigation measures undertaken in compliance with regulatory requirements have resulted in training restrictions that reduce training flexibility and ultimately reduce training realism. All at-sea training is impacted to some degree; impacts are most significant to integrated warfare training using active underwater acoustic sources. The Navy and National Marine Fisheries Service (NMFS) have developed science based protective and mitigation measures that adequately protect marine species while accommodating military readiness activities. The Navy continues to develop Environmental Impact Statements and obtain permits and authorizations for its range complexes to ensure military training complies with applicable laws and regulations. Litigation risks remain a concern, entailing the potential to delay or further restrict training, despite the protective and mitigation measures applied by the Navy in compliance with the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA). Endangered species/critical habitat encroachment from the North Atlantic right whale has created avoidance areas that have resulted in some reduction of training days and prohibits certain training events. This area is relatively small in scope; however, if these types of restrictions were applied to other species/areas, there would be significant impacts to readiness through reduction in range access, segmentation of training/reduction in realism, limits on the application of new technologies, raised flight altitudes, reduced live fire proficiency, increased personnel tempo, and increased O&M costs. The Navy will continue to invest in marine mammal research; rely on scientifically valid empirical data results as basis of marine mammal mitigation development; factor mitigation effectiveness into permit requests and continue education of Fleet units to adhere to the maritime protective and mitigation measures and public education outreach efforts. Navy's authorizations under the MMPA and ESA include an adaptive management approach that includes continually evaluating existing mitigation measures for their potential impacts on training. If impacts on training from mitigation measures are identified and documented, Navy will raise these impacts with NMFS for resolution during an annual adaptive management review process.</p>

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

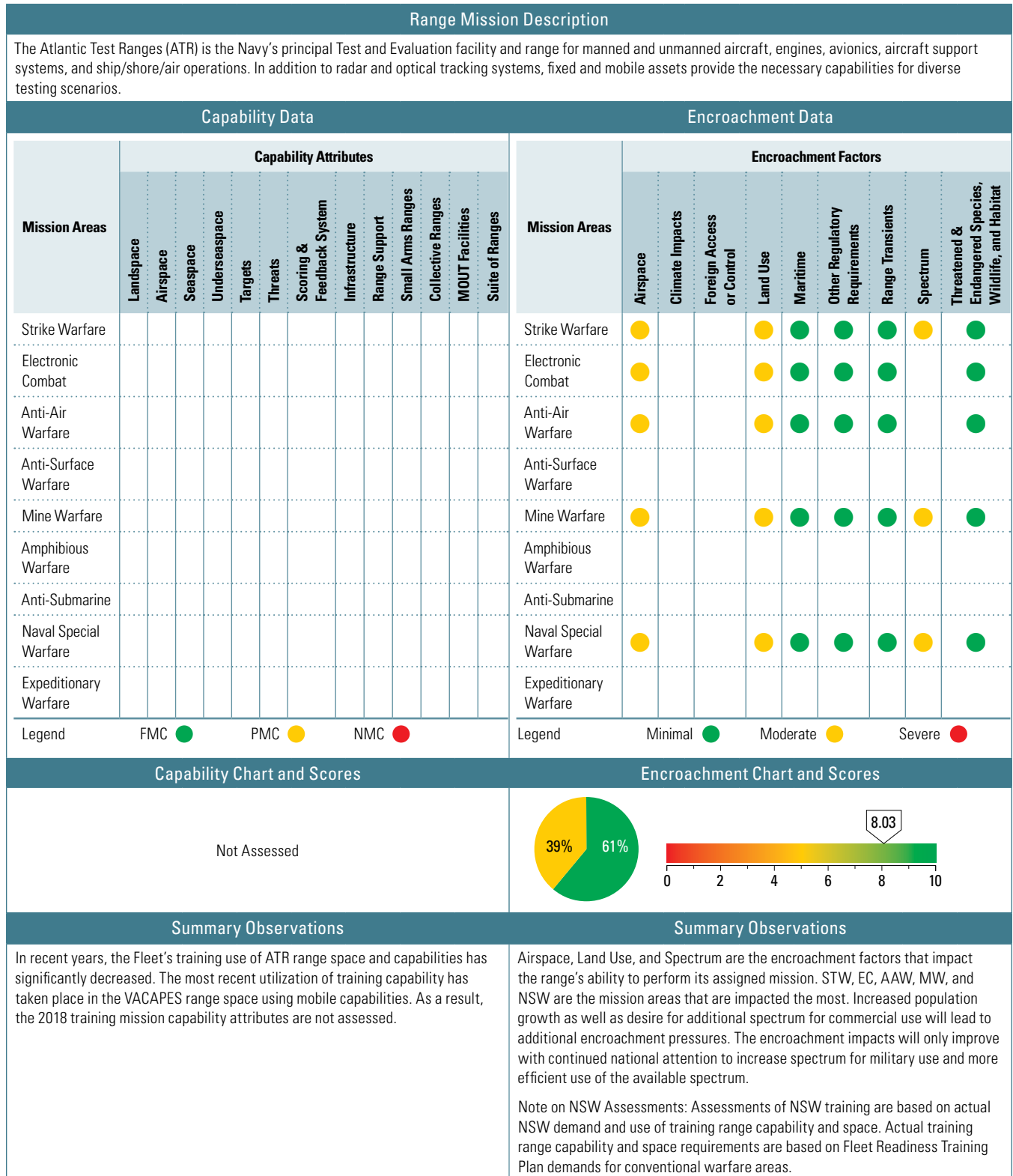
Atlantic City Detailed Comments

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Spectrum	Anti-Surface Warfare (ASUW)		Employment of Link 16, SPY-1 radar, SPS 49 radar, and Identification Friend or Foe (IFF) are restricted. Restrictions limit spectrum operations and prohibit certain training events, segment training/reduce realism, reduce training days, limit application of new weapons technologies, and inhibit new tactics development. The Navy continues to coordinate with appropriate frequency allocation and oversight agencies to seek spectrum relief and to develop encroachment strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies. Competition for frequency spectrum will add increased pressure on available bandwidth for Naval operations.

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Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Atlantic Test Ranges Assessment Details



Atlantic Test Ranges Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	7.17	7.93	7.93	7.93	7.93	7.93	Encroachment Scores	8.33	8.33	8.33	8.33	8.33	8.45
Use of ATR range space and capability for training is extremely limited.							The overall encroachment score for CY2017 dropped slightly from 2015 due to changes made in encroachment factors and definitions. Encroachment pressures have remained constant at the Atlantic Test Range since 2008. It is anticipated that they will remain stable in the future.						

Atlantic Test Ranges Detailed Comments

Capability Observations




Attributes	Assigned Training Mission	Score	Comments
Not Assessed.			

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Strike Warfare (STW)	●	Pressure from the Federal Aviation Administration (FAA) to route civil air traffic into operational areas threatens to impact flight operations during normal periods. Private and commercial flights increase the volume of traffic and spill into SUA. This reduces the availability of restricted SUA and can limit/change flight operations. ATR will continue coordination with airport planning agencies and the FAA to mitigate impacts.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
Land Use	Strike Warfare (STW)	●	Urban development on the Eastern Shore can result in reduced access to land based targets and surface operating areas. Urban development in Lexington Park has the potential to impact preferred flight paths. Wind energy development on the Eastern Shore can impact low level MTRs, present false targets on airborne radar systems, and affect some EW systems. This results in modifications to some operations/flight paths. The Navy plans to continue efforts to monitor planned and proposed residential and commercial development and provide feedback to community planners and developers. The range supports adoption of local zoning ordinances and/or state laws to control heights and placement of wind turbines, and established a Risk of Adverse Impact on Military Operations and Readiness Area (RAIMORA) to inform wind energy developers of possible conflicts. Noise complaints from routine aircraft operations and occasional sonic booms are generated around complex airfields, though these are primarily linked to operations at NAS Patuxent River. NAS modified operations to reduce noise. Increased noise complaints could compromise operations through pressure to change or discontinue specific ops. ATR will continue to respond to community concerns via the noise hotline, mitigate sonic boom impacts via the sonic boom monitors and sonic boom prediction tool model, issue press releases for noisy operations, conduct awareness regarding noise issues to squadrons, and convey to the public the importance of the Navy's mission.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

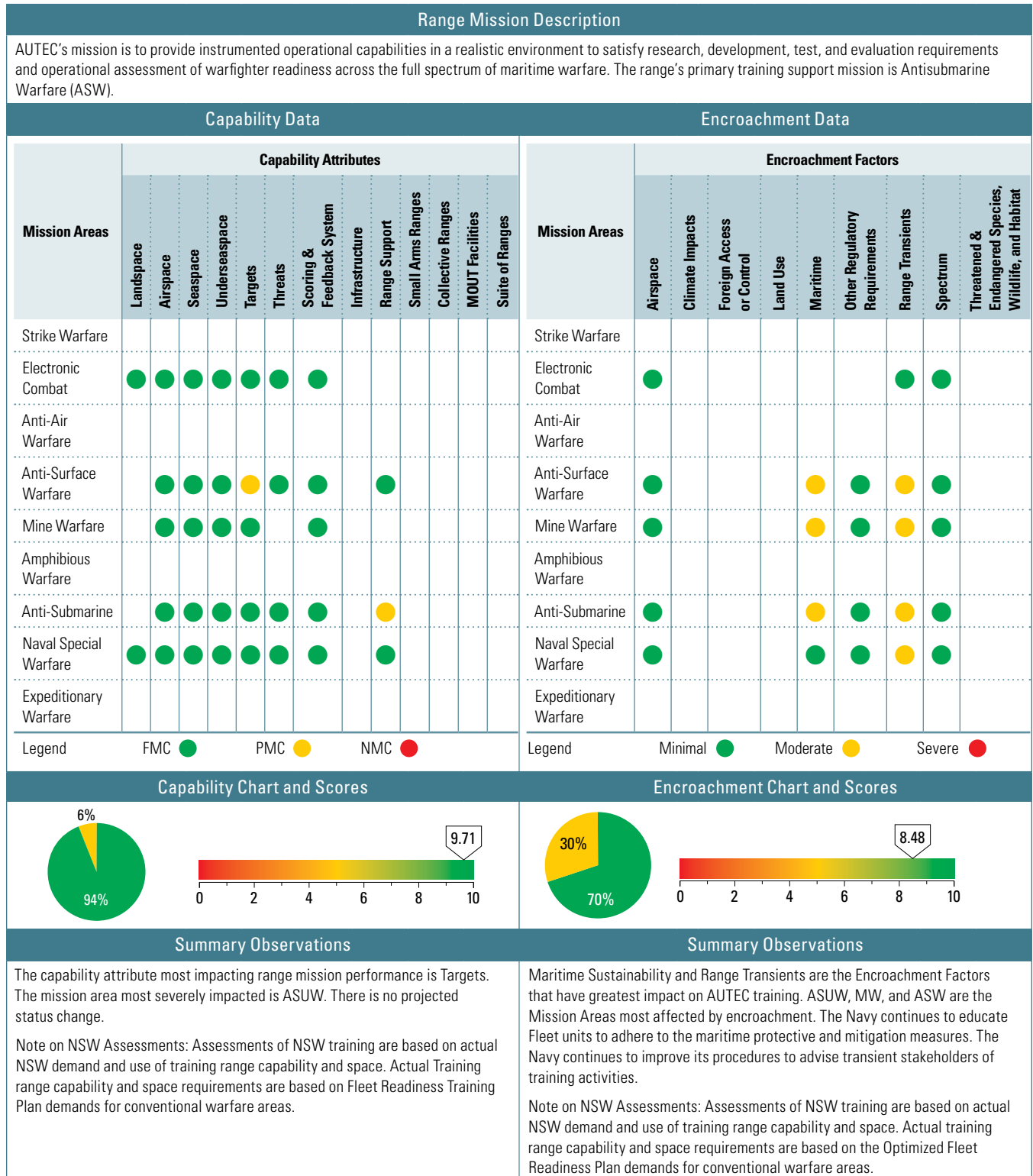
Atlantic Test Ranges Detailed Comments

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Spectrum	Strike Warfare (STW)		Reduction of available spectrum coupled with the increase in frequency requirements limits the range's ability to schedule certain types of events and many concurrent activities. Planned actions to remedy include working through the Range Commanders Council (RCC) to address spectrum requirements at the national level and continue to press for the increased availability of spectrum for use by both the community and Navy.
	Mine Warfare (MW)		Same as above.
	Naval Special Warfare (NSW)		Same as above.

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Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Atlantic Undersea Test and Evaluation Center (AUTEC) Assessment Details



Atlantic Undersea Test and Evaluation Center (AUTEC) Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	9.86	9.86	9.86	9.86	9.86	9.86	Encroachment Scores	9.25	8.33	8.33	8.33	8.33	8.33
The capability assessment had been stable since 2008; however, the score has decreased slightly in 2017 due to damage sustained by Hurricane Matthew in October 2016. The score is expected to improve when facility repairs have been completed.							Encroachment assessments for CY2008 were different than for CY2009–2015. The algorithm for the overall assessment score for 2009–2015 was revised from the original algorithm used in 2008 to provide greater fidelity and consistency across all range complexes. Based on an improved review process and revised algorithms, the assessments for CY2009–2015 provide a more accurate assessment of encroachment. The assessments for the latter years reveal there has been little encroachment change from year to year, with relatively constant overall scores through to 2015. Potential foreign investment and accompanying regional development in the vicinity of the AUTEC Range may emerge as a potential encroachment issue for Fleet training and certification. The unique ecosystem available in the Bahamas may lead to future economic development in the region and potentially introduce USN OPSEC concerns and issues; One example of industry is aquaculture.						

Atlantic Undersea Test and Evaluation Center (AUTEC) Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Targets	Anti-Surface Warfare (ASUW)	●	Training targets lack the required spectral threat signature and may not be engaged with live ordnance (Hellfire Missiles) due to net explosive weight (NEW) limits. This reduces realism and limits tactics that can be employed during training. Recommend investing in spectral augmentation and investigating options to obtain inert Hellfire assets; no completion date identified.
Range Support	Anti-Submarine (ASW)	●	The Torpedo Post-Run Facility and MK30 Target Facility were damaged by Hurricane Matthew in October 2016. The damage has impacted the throughput of those facilities and has limited overall ASW event capacity. Repair completion date is estimated to be June 2017.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Maritime	Anti-Surface Warfare (ASUW)	●	Maritime protective and mitigation measures undertaken in compliance with regulatory requirements have resulted in training restrictions that reduce training flexibility and ultimately reduce training realism. All at-sea training is impacted to some degree; impacts are most significant to integrated warfare training using active underwater acoustic sources. The Navy and NMFS have developed science based protective and mitigation measures that adequately protect marine species while accommodating military readiness activities. The Navy continues to develop Environmental Impact Statements and obtain permits and authorizations for its range complexes to ensure military training complies with applicable laws and regulations. Litigation risks remain a concern, entailing the potential to delay or further restrict training, despite the protective and mitigation measures applied by the Navy in compliance with the MMPA and ESA. Endangered species/critical habitat encroachment from the North Atlantic right whale has created avoidance areas that have resulted in some reduction of training days and prohibits certain training events. This area is relatively small in scope; however, if these types of restrictions were applied to other species/areas, there would be significant impacts to readiness through reduction in range access, segmentation of training/reduction in realism, limits on the application of new technologies, raised flight altitudes, reduced live fire proficiency, increased personnel tempo, and increased O&M costs. The Navy will continue to invest in marine mammal research; rely on scientifically valid empirical data results as the basis of marine mammal mitigation development; factor mitigation effectiveness into permit requests; and continue education of Fleet units to adhere to the maritime protective and mitigation measures and public education outreach efforts. Navy's authorizations under the MMPA and ESA include an adaptive management approach that includes continually evaluating existing mitigation measures for their potential impacts on training. If impacts on training from mitigation measures are identified and documented, Navy will raise these impacts with NMFS for resolution during an annual adaptive management review process.
	Mine Warfare (MW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

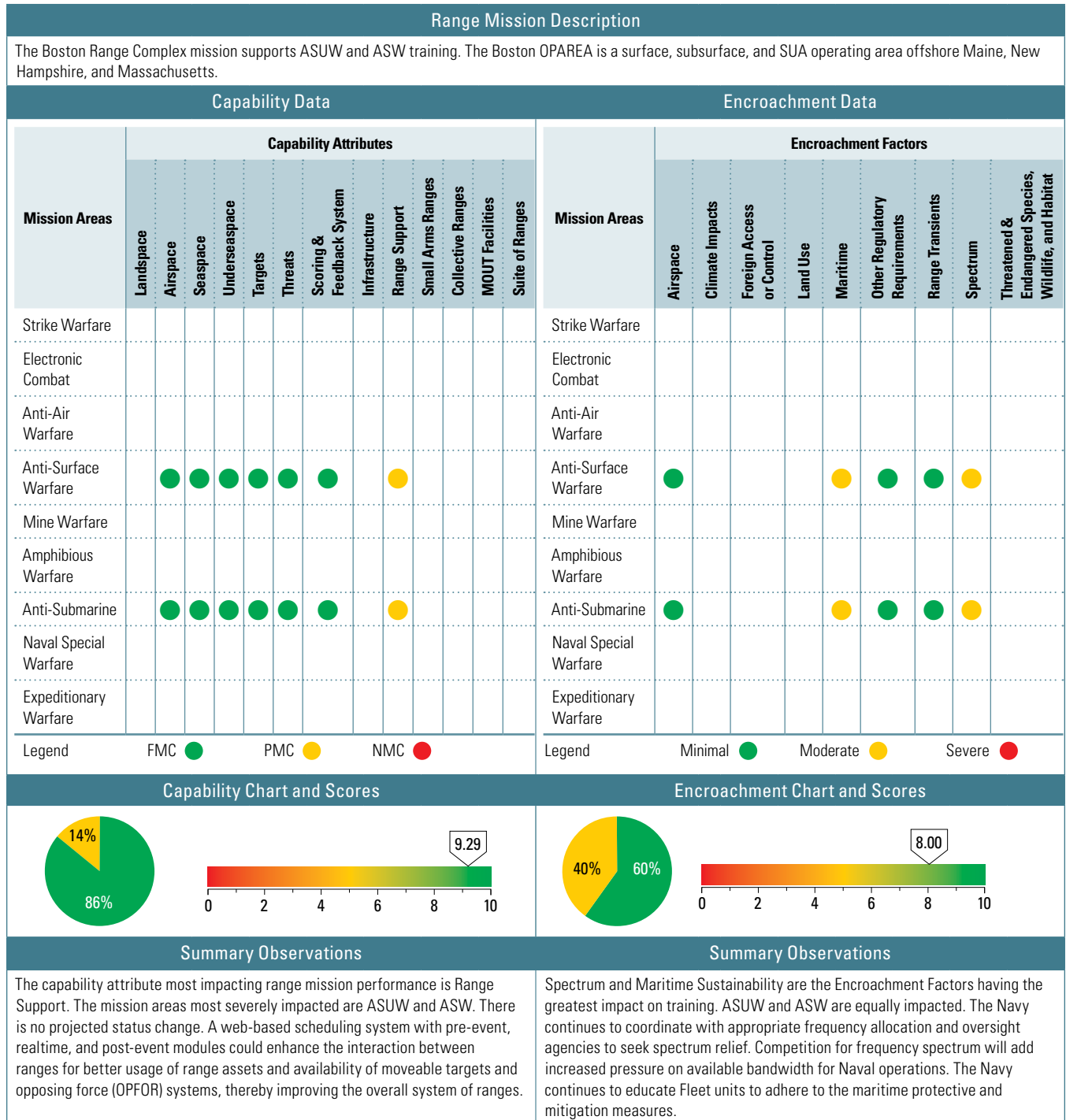
Atlantic Undersea Test and Evaluation Center (AUTEC) Detailed Comments

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Range Transients	Anti-Surface Warfare (ASUW)	●	Range transients, involving commercial shipping, commercial fishing, and private pleasure boating encroach on training, either by delaying events or forcing relocation to less than optimum locations. Commercial vessel and recreational vessel encroachment creates avoidance areas and segments training/reduces realism. The Navy will continue to pursue opportunities to inform industry and the public of the impact of range transient encroachment on At Sea OPAREAS and Navy readiness.
	Mine Warfare (MW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.

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Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Boston Assessment Details



Boston Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	8.93	9.29	9.29	9.29	9.29	9.29	Encroachment Scores	9.17	8.00	8.00	8.00	8.00	8.00
The assessment score has remained stable since 2009. No changes are anticipated.							Encroachment assessments for CY2008 were different than for CY2009–2015. The algorithm for the overall assessment score for 2009–2015 was revised from the original algorithm used in 2008 to provide greater fidelity and consistency across all range complexes. Based on an improved review process and revised algorithms, the assessments for CY2009–2015 provide a more accurate assessment of encroachment. The assessments for the latter years reveal there has been little encroachment change from year to year, with relatively constant overall scores through to 2015. The Northeast, Virginia Capes, and Chesapeake Bay Offshore Encroachment Action Plan (EAP), including the Boston Range Complex, was completed in November 2015. DOI and private energy interests in the OCS are increasing as domestic energy demand builds. Naval offshore operating areas and training events may be affected. High priority areas include training ranges and sea space in and adjacent to all Navy OPAREAs. OASN (EI&E) continues to work closely with the Fleets and DOI's BOEM to resolve issues of combined use of the OCS important to both agencies. Fleet review & analysis of impacts from both oil, gas and wind energy "lease sale" areas have been reviewed and forwarded to OSD. DoD & DOI coordination continues. Expect an additional round of reviews later in CY2017. Massachusetts and Federal officials designated a 3,000 square mile area of ocean south of Cape Cod available for lease to developers of commercial scale offshore wind farms. Future wind farms may have the potential to affect military operations in the Boston training area; however, good coordination among Federal and state task force representatives and DoD and Navy planners has limited any impact to maritime training. Emerging encroachment issues that may impact Boston Range Complex training include establishment of OOS and acoustic sensors/Remotely Operated Vehicles (ROVs); nomination, approval and expansion of NMS, either within or in the vicinity of surface and submarine training space and transit lanes (ex. NE Canyons and Seamounts Marine National Monument); power and telecommunications undersea cable distribution near sensitive training space; and commercial shipping anchorage area and sea lane expansion.						

Boston Detailed Comments

Capability Observations



Attributes	Assigned Training Mission	Score	Comments
Range Support	Anti-Surface Warfare (ASUW)		A lack of a web-based scheduling system with pre-event, real-time, and post-event modules precludes most efficient scheduling and documenting of range usage. Post-event reporting is particularly critical for ordnance expenditures or active sonar usage in at-sea OPAREAs since MMPA permits require Navy to periodically report these values. Non-compliance or inaccurately reporting post-event values to regulators risks range access or prohibitions on training events that involve active sonar or high explosives at-sea. OPNAV N98 has determined that the DCAST system will be the SUA scheduling tool for all Fleet Area Control and Surveillance Facilities (FACSFACs) and all other Air Traffic Control facilities with SUA reporting requirements. DCAST system programmers are conducting site visits to the FACSFACs to gather operating area and airspace data to develop DCAST for each location.
	Anti-Submarine (ASW)		Same as above.

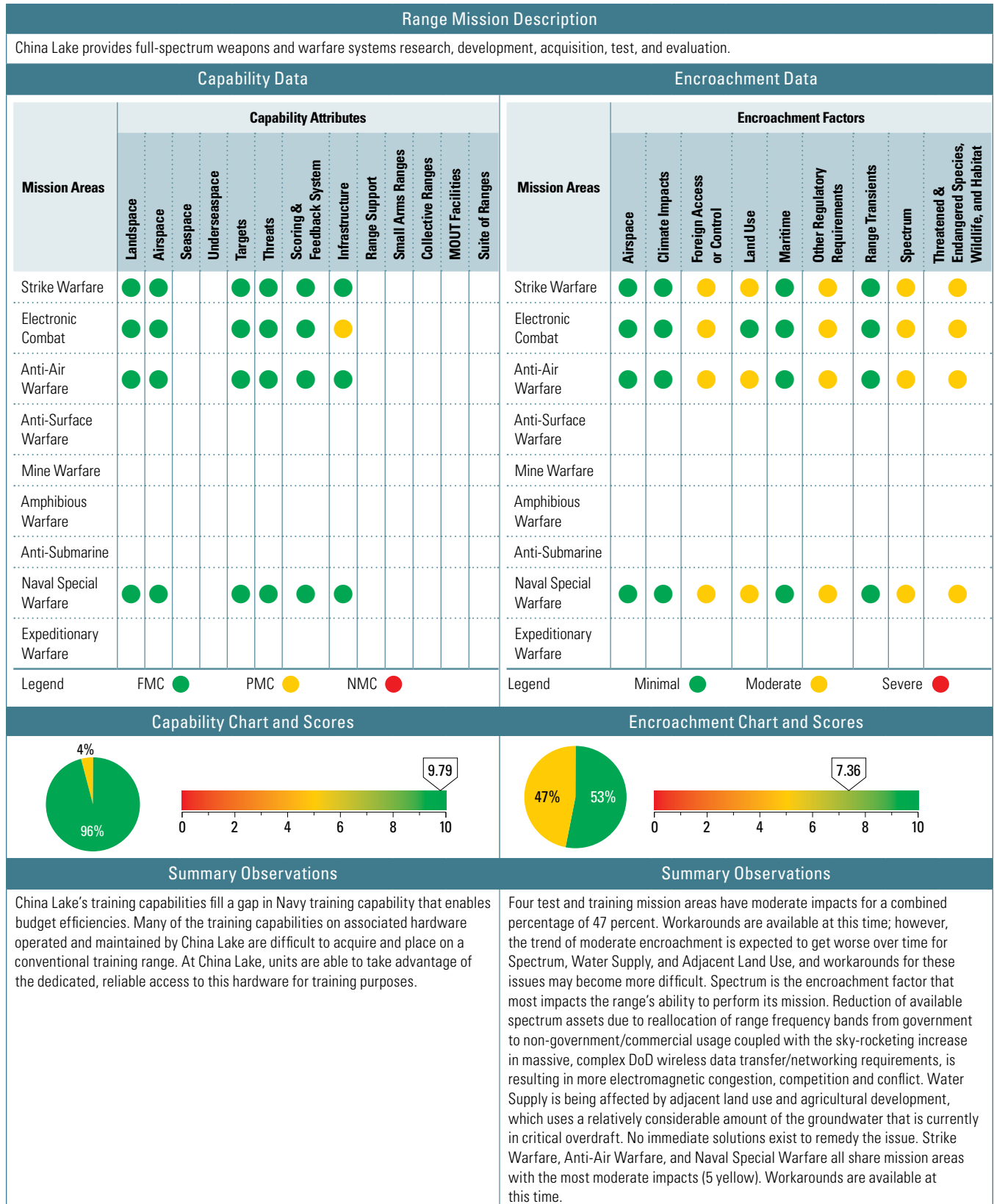
Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)**Boston Detailed Comments**

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Maritime	Anti-Surface Warfare (ASUW)	●	Maritime protective and mitigation measures undertaken in compliance with regulatory requirements have resulted in training restrictions that reduce training flexibility and ultimately reduce training realism. All at-sea training is impacted to some degree; impacts are most significant to integrated warfare training using active underwater acoustic sources. The Navy and NMFS have developed science based protective and mitigation measures that adequately protect marine species while accommodating military readiness activities. The Navy continues to develop Environmental Impact Statements and obtain permits and authorizations for its range complexes to ensure military training complies with applicable laws and regulations. Litigation risks remain a concern, entailing the potential to delay or further restrict training, despite the protective and mitigation measures applied by the Navy in compliance with the MMPA and ESA. Endangered species/critical habitat encroachment from the North Atlantic right whale has created avoidance areas that have resulted in some reduction of training days and prohibits certain training events. This area is relatively small in scope; however, if these types of restrictions were applied to other species/areas, there would be significant impacts to readiness through reduction in range access, segmentation of training/reduction in realism, limits on the application of new technologies, raised flight altitudes, reduced live fire proficiency, increased personnel tempo, and increased O&M costs. The Navy will continue to invest in marine mammal research; rely on scientifically valid empirical data results as basis of marine mammal mitigation development; factor mitigation effectiveness into permit requests; and continue education of Fleet units to adhere to the maritime protective and mitigation measures and public education outreach efforts. Navy's authorizations under the MMPA and ESA include an adaptive management approach that includes continually evaluating existing mitigation measures for their potential impacts on training. If impacts on training from mitigation measures are identified and documented, Navy will raise these impacts with NMFS for resolution during an annual adaptive management review process.
	Anti-Submarine (ASW)	●	Same as above.
Spectrum	Anti-Surface Warfare (ASUW)	●	Employment of Link 16, SPY-1 radar, SPS 49 radar, and IFF are restricted. Restrictions limit spectrum operations and prohibit certain training events, segment training/reduce realism, reduce training days, limit application of new weapons technologies, and inhibit new tactics development. The Navy continues to coordinate with appropriate frequency allocation and oversight agencies to seek spectrum relief and to develop encroachment strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies. Competition for frequency spectrum will add increased pressure on available bandwidth for Naval operations.
	Anti-Submarine (ASW)	●	Same as above.

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Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

China Lake Assessment Details



China Lake Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	9.88	9.82	9.82	9.82	9.82	9.79	Encroachment Scores	9.20	8.50	8.13	8.13	8.13	7.95
China Lake's range assessment's and utilization have remained stable over the history of Sustainable Range reporting.							Several areas within the test and training domains are subject to moderate encroachment. The moderate encroachment experienced in these areas is not currently adversely impacting the ability of the China Lake Ranges to meet test and training requirements. Currently, workarounds and/or mitigations are available. The trend of moderate encroachment is expected to get worse over time and workarounds may become more difficult. This is especially true in the areas of spectrum and energy development. Spectrum and energy development are the encroachment factors that most impact the range's ability to perform its mission at the current time. Reduction of available spectrum assets due to reallocation of military frequency bands from government to non-government/commercial usage coupled with the increase in complex, frequency intensive DoD systems increase the risk of not being able to meet test requirements. Development of wind energy threatens unique test and evaluation systems and the ability to conduct certain test operations within the range. Wind energy development in proximity to the range also degrades the ability of the air traffic control and military radar Unit to provide advisory services which increases the risk of aircraft mishaps. The China Lake Ranges are not currently experiencing any severe impacts from encroachment. The China Lake Ranges are experiencing some moderate impacts in the test and training domains, which could get worse over time and will be monitored closely by the Range's Sustainability Office.						

China Lake Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Infrastructure	Electronic Combat (EC)	●	There is a lack of improved threat emitter sites on the Electronic Combat Range. This reduces "time to target" realism that is achieved through target diversity and quick placement of emitters, a key element of fleet training.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Foreign Access or Control	Strike Warfare (STW)	●	Navy is concerned with foreign intelligence collection opportunities resulting from a persistent foreign presence proximate to Navy operations, testing, and training equities ashore and at-sea. As previously stated in the 2025 Air Test and Training Range Enhancement Plan, "An emerging challenge is the increasing presence of foreign business interests in the vicinity of our sensitive test and training ranges." Foreign acquisition of real estate in close proximity to China Lake, a critical training and testing range, offers the ability to maintain a permanent presence near areas vital to Navy missions and national security, and facilitate an opportunity to collect critical information regarding national defense programs. Additionally, foreign investment to acquire U.S. businesses that operate near Navy activities is another avenue for establishing a permanent presence that presents very unique mission compatibility challenges. Navy actively engages in the Council on Foreign Investment in the United States (CFIUS), Fleet Commanders, Navy Region Commanders, and community planner to evaluate the security risks of foreign investment acquisitions in proximity to DoD equities. Although Navy considers this to be a potential encroachment threat for all testing and training ranges, the Navy's CFIUS Office (Proximity), in close coordination with the mission owners, has tracked and monitored foreign investment activities near China Lake and many other key ranges.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

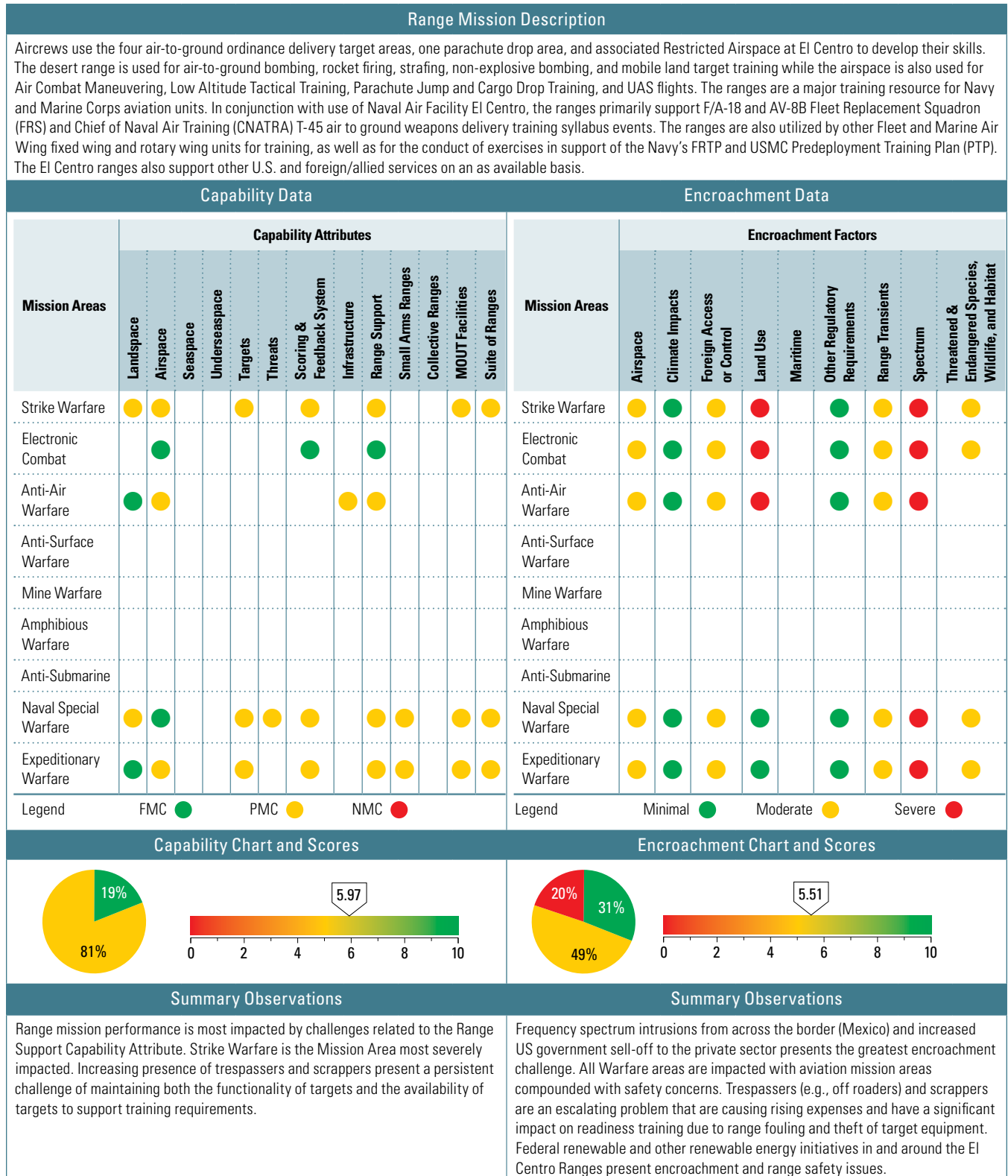
China Lake Detailed Comments

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Land Use	Strike Warfare (STW)	●	There are thousands of wind turbines in the Tehachapi-Mojave area southwest of China Lake and multiple proposals for additional wind energy facilities in the region. Wind turbines adversely affect radar systems and, as a result, testing of airborne radars cannot be conducted with systems looking towards Tehachapi-Mojave. If additional turbines are constructed in other areas, specification testing of airborne systems would be severely limited. The Navy participates in intensive engagement with land use jurisdictions (counties, BLM, etc.), wind energy developers, and works with the DoD Siting Clearinghouse to influence where wind turbines can be constructed without mission impacts. The Navy is also working on development of zoning ordinances and other land use policies that require wind energy development to be compatible with the military mission.
	Anti-Air Warfare (AAW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
Other Regulatory Requirements	Strike Warfare (STW)	●	There are a vast number of archeological sites and keen interest by local Native American tribes; no National Historic Preservation Act (NHPA) Section 106 Programmatic Agreement with the State Historic Preservation Office (SHPO). This requires significant mitigation and outreach efforts, and significantly increases the planning time for test events. Planned actions to remedy the issue include performing future cultural resource surveys, consulting with SHPO, and routinely updating the Installation Cultural Resources Management Plan (ICRMP) and as needed, the Programmatic Agreement with SHPO. Supporting personnel rely on groundwater as the single source of potable water supply. This groundwater is in a condition of critical overdraft. Testing is not yet threatened, but would be severely impacted, even curtailed, if water supply diminishes in the future to the point where potable water supply is no longer available to 3000+ support staff and associated community services. Kern County, in partnership with Navy and local water district, is currently exploring options to reduce excessive water usage by agriculture, as well as obtaining imported water. A date of remediation, or feasible solutions to reduce impact, are unknown, but is not expected for at least two to three more years.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
Spectrum	Strike Warfare (STW)	●	Reduction of available spectrum coupled with the increase in spectrum requirements impact the mission. This limits the ability to schedule certain types of events and many concurrent activities. The solution has been coordination at the local level to deconflict when possible. The range will work through the chain of command and Range Commanders Council to address spectrum requirements at the national level.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Strike Warfare (STW)	●	Presence of T&E species and critical habitat at China Lake impact military activities. This requires a significant mitigation effort to support testing activities. The trend is expected to improve due to an enhanced Biological Assessment/Biological Opinion (BA/BO) with USFWS, continued mitigations, and updating EIS/LEIS.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.

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Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

El Centro Assessment Details



El Centro Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	6.39	6.39	9.00	9.00	9.00	7.22	Encroachment Scores	9.86	9.80	10.00	10.00	10.00	6.82
<p>In 2008 and 2009, this range was also evaluated for AW and Electronic Warfare. In 2010, mission areas were revised to support only Strike Warfare. In 2014 EW was again a warfare area being conducted on the range. El Centro Ranges are scheduled via MCAS Yuma Range Schedules which adopted RFMSS as it's scheduling and range data collection and management tool in FY2009. Pacific Fleet's DCAST represents another scheduling and range data collection option that includes a customizable scheduling, event deconfliction, range map graphics generation, schedule notification and automatic reports generation modules. The El Centro Ranges are being utilized for extensive Expeditionary Warfare (EXW) training and readiness. Naval Expeditionary Warfare Command (NECC) has identified the need for a Tactical Training Complex, and developed FARP, both of which will support all EXW FTRP readiness requirements for NECC units stationed within the greater San Diego Fleet Concentration Area.</p>							<p>The algorithm for the overall assessment score for 2009–2011 was revised from the original algorithm used in 2008 to provide greater fidelity and consistency across all range complexes. Based on an improved review process and revised algorithms, the assessments for CY2009, 2010, and 2011 provide a more accurate assessment of encroachment. The assessments for the latter years reveal there has been little encroachment change from year to year, with relatively constant overall scores. Since 2011, the installation continues to review new development projects when notified by Imperial County to ascertain encroachment effects, if any, to operations and advise the county on favorable decision-making outcomes. Similarly, the installation CPLO continues to proactively engage with private developers and federal landowners prior to submittal of development applications, to offer advice regarding potential impacts that could be expected from their projects on military operations.</p> <p>The U.S. Fish and Wildlife Service (USFWS) ruled on March 15, 2011 that the listing of the flat-tailed horned lizard as a threatened species under the ESA is not warranted. This strengthens the range wide management strategy that aids the conservation of the species habitat. Three of the Air to Ground Target Areas are contained within the Flat-Tailed Horned Lizard Management Area and have potential impact on further growth of Strike Warfare activities. The potential for expansion of military activities within these areas is limited by the level of potential habitat disturbance those activities could cause. The Navy and BLM are signatory agencies of the Interagency Coordinating Committee as outlined in the initial 1997 Range-wide Management Strategy to further define metrics for application in determining current and future military training activity habit disturbance levels. There are potential encroachment pressures (Adjacent Land Use) from alternative energy initiatives on public lands adjacent to the range areas, recreation activities in the vicinity of range boundaries, and incursion of off-road vehicles into the range areas. The El Centro management is currently addressing these issues using public awareness outreach and enhanced warning and control measures.</p>						

El Centro Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landscape	Strike Warfare (STW)	●	Laser Guided Training Round (LGTR) weapons danger zone footprint modeling indicated that unconstrained release parameters had potential for off military controlled property impact. Minor restrictions on release profile altitudes and airspeeds have been implemented with minimal impact on training fidelity. El Centro is investigating laser certification for alternate established targets that would not require release parameter restrictions. Results of survey and determination of potential for alternative target certification to be determined.
	Naval Special Warfare (NSW)	●	Landscape within the target areas does not support 360 degree live fire and maneuver, or Urban Targets. NSW must compete for training time with the Marine Corps at Yuma Range complex. El Centro is investigating construction of an Urban Target Complex (UTC) (the "Yodaville UTC") at Target 102. Results of survey and determination of potential for target construction to be determined.
Airspace	Strike Warfare (STW)	●	Restricted airspace over Target 101 is insufficient to accommodate weapons delivery profiles. R-2510 requires expansion to the east to ensure aircraft remain within restricted airspace during all phases of weapons delivery. El Centro will engage with FAA to expand R-2510 within the existing MOA.
	Anti-Air Warfare (AAW)	●	AW Airspace over targets scheduled by MCAS Yuma cannot be dual scheduled by altitude blocks in RFMSS. Not enough airspace to conduct AW. SUA scheduled by MCAS Yuma must compete for training time with STW, EXW, and NSW scheduled events in RFMSS. El Centro and CNAP are investigating the moving of El Centro Ranges land and airspace to DCAST to facilitate greater fidelity in scheduling to support AW requirements from MCAS Yuma while maintaining STW, EXW, and NSW access to targets.
	Expeditionary Warfare (EXW)	●	AW Airspace over targets scheduled by MCAS Yuma cannot be dual scheduled by altitude blocks in RFMSS. EXW must compete for live-fire and UAS training time with STW and MCAS Yuma AW scheduled events in RFMSS. El Centro and CNAP are investigating the moving of El Centro Ranges land and airspace to DCAST to facilitate greater fidelity in scheduling to support AW requirements from MCAS Yuma while maintaining STW, EXW, and NSW access to targets.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

El Centro Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Targets	Strike Warfare (STW)	●	Target 95 lacks scoring and instrumentation feedback. There are no realistic urban CAS targets and the Mobile Land Target (MLT) is track only. Lack of feedback reduces realistic training and prohibits certain events. The MLT is underutilized due to lack of dynamic presentations. No definitive plans for addressing shortfalls are in progress.
	Naval Special Warfare (NSW)	●	Urban targets do not support 360 degree live fire and maneuver, and the range currently does not have Urban CAS areas. NSW must compete for training time with the Marine Corps at Yuma Range complex. El Centro is investigating construction of an UTC at Target 102. Results of survey and determination of potential for target construction to be determined.
	Expeditionary Warfare (EXW)	●	Urban targets do not support 360 degree live fire and maneuver. There is no MOUT compound that supports EXW. El Centro is investigating construction of an MOUT at Target 102. Results of survey and determination of potential for target construction to be determined.
Threats	Naval Special Warfare (NSW)	●	NSW must compete for training time with the Marine Corps at Yuma Range complex. El Centro is investigating construction of an UTC at Target 102. Results of survey and determination of potential for target construction to be determined.
Scoring & Feedback System	Strike Warfare (STW)	●	Target 95 lacks scoring and instrumentation feedback. The lack of feedback reduces realistic training and prohibits certain events. Target 95 is being evaluated to also serve as an NECC Tactical Training Complex and a UAS Center of Excellence in lieu of instrumentation.
	Naval Special Warfare (NSW)	●	Target 95 lacks scoring and instrumentation feedback. There is no range data recorder to capture weekend range utilization or “blue force tracker” type instrumentation to capture small force training. The lack of feedback reduces realistic training and prohibits certain events. Target 95 is being evaluated to become an NECC Tactical Training Complex and a UAS Center of Excellence in lieu of instrumentation.
	Expeditionary Warfare (EXW)	●	Same as above.
Infrastructure	Anti-Air Warfare (AAW)	●	The Tactical Combat Training System (TCTS) system at El Centro was removed by CNAP due to lack of use. Lack of feedback reduces realistic training and prohibits certain events, and lack of DASR integration prevents range coverage of R-2510 airspace.
Range Support	Strike Warfare (STW)	●	Range equipment theft and damage at the target area by trespassers and scrappers is an exponentially growing problem. Local and Federal law enforcement is unable to assign the manpower necessary to deter and significant numbers of range equipment is located outside of existing security perimeters. Training is disrupted for trespassers or is cancelled due to equipment damage and theft, and certain events become prohibited. Planning for more security infrastructure at the target areas is an ongoing effort.
	Anti-Air Warfare (AAW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Range security is an exponentially growing problem. Local and Federal law enforcement is unable to assign the manpower necessary to deter significant numbers of trespassers and provide required security perimeters for NSW training events. Training is disrupted for trespassers or is cancelled due to equipment damage and theft, and certain events become prohibited. Planning for more security infrastructure at the target areas is an ongoing effort.
	Expeditionary Warfare (EXW)	●	Same as above.
Small Arms Ranges	Naval Special Warfare (NSW)	●	No range provided crew-served weapons and small arms tactical training range in the San Diego Fleet Concentration Area. A Tactical Training Complex at Target 95 supports 100% of San Diego Fleet Concentration Area small arms and crew-served weapons FRTP training requirements. The lack of such a range degrades readiness, reduces realism; inhibits tactics; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. San Diego stationed units must spend PERSTEMPO and limited travel to attain this training elsewhere. FRTP timing precludes “as available” range time at USMC ranges.
	Expeditionary Warfare (EXW)	●	Same as above.
MOUT Facilities	Strike Warfare (STW)	●	There is no MOUT compound that supports STW. Strike Fighter FRS and Fleet HSM and HSC aircrew utilizing El Centro for STW training have a MOUT target requirement. Helicopters also have MOUT insert and extract readiness requirements. El Centro is investigating construction of a MOUT at Target 102. Results of survey and determination of potential for target construction to be determined.
	Naval Special Warfare (NSW)	●	There is no MOUT compound that supports EXW and NSW. EXW and NSW JTAC training requires a MOUT. Additionally, a MOUT would support NSW helo insert and extract readiness requirements. El Centro is investigating construction of an MOUT at Target 102. Results of survey and determination of potential for target construction to be determined.
	Expeditionary Warfare (EXW)	●	Same as above.

El Centro Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Suite of Ranges	Strike Warfare (STW)	●	USMC's Weapons Training Instruction (WTI) course, a non-FRTP event, has a higher range scheduling priority than detached FRS and CNATRA squadrons. This disrupts the Navy's FRTP by inducing excessive delays in pilot and NFO training throughput, prohibits certain training events in a time-critical syllabus, segments training, and reduces realism. There are no current actions to remedy and no anticipated resolution date.
	Naval Special Warfare (NSW)	●	USMC's WTI course, a non-FRTP event, has a higher range scheduling priority than NECC and NSW units in a FRTP deployment cycle. This disrupts the Navy's FRTP for deploying units, prohibits certain training events in a time-critical syllabus, segments training, and reduces realism. There are no current actions to remedy and no anticipated resolution date.
	Expeditionary Warfare (EXW)	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Strike Warfare (STW)	●	There are horizontal and vertical limits on existing restricted airspace and FAA flight altitude cap, along with existing and increasing civilian air traffic. These limitations create avoidance areas; prohibit certain training events; segment training and reduce realism; and limit current and new tactics and technologies. El Centro continues to engage the FAA regarding the expansion of restricted airspace. No anticipated resolution date.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.
Foreign Access or Control	Strike Warfare (STW)	●	Navy is concerned with foreign intelligence collection opportunities resulting from a persistent foreign presence proximate to Navy operations, testing, and training equities ashore and at-sea. As previously stated in the 2025 Air Test and Training Range Enhancement Plan, "An emerging challenge is the increasing presence of foreign business interests in the vicinity of our sensitive test and training ranges." Additionally, foreign investment to acquire U.S. businesses that operate near Navy activities is another avenue for establishing a permanent presence that presents very unique mission compatibility challenges. Navy actively engages CFIUS, Fleet Commanders, Navy Region Commanders, and community planner to evaluate the security risks of foreign investment acquisitions in proximity to DoD equities. Although Navy considers this to be a potential encroachment threat for all testing and training ranges, the Navy's CFIUS Office (Proximity), in close coordination with the mission owners, has tracked and monitored foreign investment activities near many key ranges.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.
Land Use	Strike Warfare (STW)	●	Existing infrastructure that transitions into the ranges and urban development adjacent to the El Centro Ranges has created avoidance areas, prevents certain training events, segments training, and increased theft of range equipment. Ongoing efforts include working with local and federal agencies to mitigate renewable energy development near or within the El Centro Ranges and planning for more security infrastructure at the target areas.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.

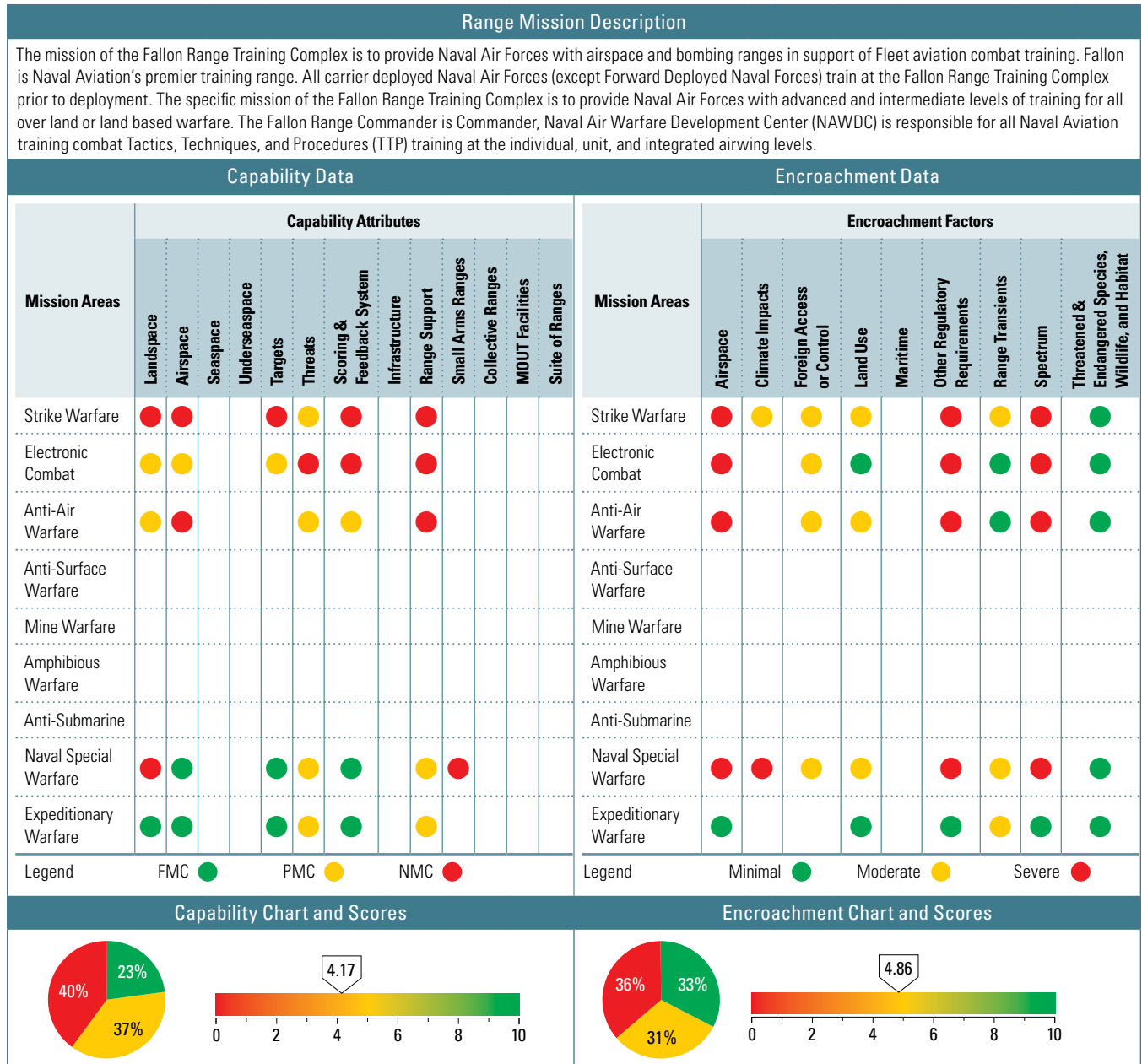
Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)**El Centro Detailed Comments**

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Range Transients	Strike Warfare (STW)	●	Existing infrastructure (e.g., roads, rail road, power lines) transitions through the ranges. El Centro has observed a marked increase in trespassers and scrappers from adjacent land. Impacts to training include the creation of avoidance areas, segmented training, and theft of range equipment preventing certain training events. Ongoing efforts include working with local and federal law enforcement as well as planning for more security infrastructure at the target areas.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.
Spectrum	Strike Warfare (STW)	●	Commercial licensing and under 18 GHz spectrum use in adjacent areas and lack of cross border frequency regulation has prohibited certain training events, segmented training, reduces realism, and limits use of existing and new technologies. No current actions to remedy. No anticipated resolution date.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Strike Warfare (STW)	●	Two special status reptile species, the flat-tailed horned lizard and the Colorado Desert fringe-toed lizard, inhabit the ranges, creating avoidance areas, segmenting training and reducing realism. The presence of these species also increases costs or risks associated with training. El Centro continues to track USFWS species status. No anticipated resolution date.
	Electronic Combat (EC)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.

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Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Fallon Range Training Complex Assessment Details



Fallon Range Training Complex Assessment Details

Summary Observations							Summary Observations						
The Capability Attributes most impacting range mission performance are: Targets, Airspace, and Landspace. Mission Areas most severely impacted are: STW and AW. Range Sustainment Support (O&M) is inadequate for EW threat coverage, the moving vehicle target, and other target programs.							All Fallon Range Training Complex (FRTC) assigned Mission Areas experience encroachment. Spectrum, Munitions and Airspace all have serious negative impacts to training but Spectrum affects the greatest number of missions, to the greatest degree, the most often and is considered the encroachment category with the greatest negative impact. The NAWDC has developed procedures and workarounds to accommodate most encroachment factors. NAWDC and the Fallon Community Plans Liaison Officer (CPLO) continue to discuss encroachment issues with the Fallon stakeholders and Encroachment Management Team (EMT), with the expectation that all will have clearer understanding of FRTC training requirements and of strategies that can relieve training encroachment restrictions. Adjacent Land Use concerns impact all fixed wing and rotary wing platforms detaching to Fallon for training but are particularly troublesome for night low-level flight such as during NSW Infiltrate/Exfiltrate (INFIL/EXFIL) operations, or Combat Search and Rescue (CSAR) training. On September 22, 2015, the Secretary of the Interior announced the Nevada Greater sage-grouse will not be listed as an endangered species. Re-evaluation of that decision will occur in September 2020.						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	5.65	5.65	6.09	6.09	6.96	6.35	Encroachment Scores	8.96	8.84	8.84	8.33	8.21	6.70
On June 15, 2015, NAWDC published the document "90 Days to Combat Required Training Capabilities for FRTC." As an outcome of this end-to-end assessment of FRTC capabilities, significant shortfalls in training capability were identified, resulting in lower capability ratings across virtually all mission areas. Landspace and Airspace capability attribute deteriorated from Green/Yellow to Yellow/Red for STW, EC, AAW, and NSW due primarily to re-evaluation of weapons danger zone (WDZ) and surface danger zone (SDZ) footprints using the new WDZ/SDZ software tool. Targets capability attribute deteriorated from Red/Green to Red/Yellow due to inventory depletion of tactically significant hard targets. EW threats capability attribute deteriorated from all Yellow to Yellow/Red due to obsolescence of existing systems and decreased investment in IADS. Scoring Systems capability attribute deteriorated from Yellow/Green to Red/Yellow/Green due to obsolescence of existing systems. Range Support capability attribute deteriorated from Yellow to Yellow/Red due to insufficient sustainment funds, personnel turnover issues, and obsolescence of existing systems. NSW small arms range capability attribute re-evaluated from White to Red. The suite of Ranges capability attributes re-evaluated from White to Yellow for STW and NSW due to limited number of dedicated Close Air Support (CAS) ranges available for concurrent integrated airwing training and Joint Terminal Attack Controller (JTAC) training. If approved, the Fallon Range Training Complex Modernization (MILCON P-442) will mitigate the capability shortfalls for Landspace, Airspace and Small Arms Ranges starting in 2021.							Encroachment assessments for CY2017 were different than for preceding years due to changes in Encroachment Factors and Definitions. Additionally, the algorithm for the overall assessment score for 2014–2017 was revised from the original algorithm used in 2008. The assessments for the latter years reveal that there has been little encroachment change from year to year, with relatively constant overall scores for 2014–2017. 2017 encroachment assessments remain essentially unchanged from preceding years. The Navy has proposed to modernize the Fallon Range Training Complex. The modernization (MILCON P-442) would include land range expansion through additional public land withdrawal and land acquisition, airspace modifications, and public land withdrawal renewal including: Renew existing public land withdrawal of 202,859 acres expiring in November 2021, withdraw and reserve for military use approximately 604,789 acres of additional public land, acquire approximately 65,160 acres of non-federal land, expand associated SUA and reconfigure existing airspace, and upgrade range infrastructure to support modernization. The Navy will conduct the same general types and tempos of aviation and ground training as currently authorized and, with the exception of Spectrum, modernization will mitigate many of the encroachment factors identified in this assessment.						

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Fallon Range Training Complex Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landscape	Strike Warfare (STW)	●	Air-to-Surface capabilities at the FRTC are currently constrained by limitations in the size of the closed lands and restricted airspace required in order to protect the public from hazardous activities. FRTC landscape does not meet CCMD training requirements; limits weapons type and employment tactics, and restricts use of laser targeting systems. These restrictions reduce realism, inhibit new tactics development, and reduce live fire proficiency. Landscape realignment as proposed in the FRTC Modernization (MILCON P-442) if approved, will begin to mitigate the capability shortfall starting in 2021.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Flare use is restricted for flights below 2,000 feet, which impacts helicopter training. This restriction reduces realism, inhibits new tactic development, and reduces live fire proficiency. Landscape realignment as proposed in the FRTC Modernization (MILCON P-442) if approved, will begin to mitigate the capability shortfall starting in 2021.
	Naval Special Warfare (NSW)	●	Surface Fires capabilities at the FRTC are currently constrained by limitations in the size of the closed lands and restricted airspace required in order to protect the public from hazardous activities. FRTC landscape does not meet CCMD training requirements, limits weapons type and employment tactics, restricts use of laser targeting systems, and there is insufficient area for Tactical Ground Mobility (TGM) ground fire and maneuver training. These restrictions reduce realism, inhibit new tactics development, and reduce live fire proficiency. Landscape realignment as proposed in the FRTC Modernization (MILCON P-442), if approved, will remediate small arms ranges and expand both the B-16 target area and the Dixie Valley Training Area to mitigate the capability shortfall starting in 2021.
Airspace	Strike Warfare (STW)	●	Evolving changes in the mission of Naval Aviation and advances in platform and weapons capabilities, along with the development, execution, and refinement of combat TTP, have necessitated increasingly larger Air-to-Air and Air-to-Surface training areas. Restrictions to airspace and altitudes means the FRTC does not meet CCMD training requirements, limits weapons employment and tactics, and precludes supersonic flight near target areas. This reduces realism, inhibits new tactics development, limits application of new weapon technologies, and reduces live fire proficiency. Airspace realignment as proposed in the FRTC Modernization (MILCON P-442), if approved, will begin to mitigate the capability shortfall starting in 2021.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
Targets	Strike Warfare (STW)	●	Inventories of tactically significant hard targets (i.e. M-60 tank hulks) for use on HEI ranges have been depleted, there is no IR augmentation, limited structural targets, and limited resources for prepared targets (such as containers for Urban Target construction and replacement). A new moving vehicle target and rail strafe system provides some moving targets, and some urban targets are available in the "Kansas" inert area. As a result, realism is reduced, the development of new tactics has been inhibited, the application of new weapon technologies has been limited, and live fire proficiency has been reduced. The targets program is assessing range target support solutions for a sustainable source of hard targets, upgrades to scoring systems; Time Sensitive Target program targets; Tactical targets; fixed and mobile EW sites; and urban complexes.
	Electronic Combat (EC)	●	Same as above.

Fallon Range Training Complex Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Threats	Strike Warfare (STW)	●	FRTC lacks long range double digit SAM threats and surveillance sensors representing modern hostile nation Integrated Air Defense System (IADS). There is no live helicopter threat capability, the quantity and variety of threats do not meet requirements, and EC threat above level 2 is not available. There are negative training implications relative to the combat requirements of several potentially hostile IADS. The threat is outpacing FRTC training systems. Open air combat training against advanced threats represented by SA-17, Roland Replacement, ARS-2, and CLPS is not possible on FRTC ranges. Fallon systems are obsolete, increasingly difficult to maintain, and will eventually have to be retired without replacements. These capability shortfalls reduce realism, inhibit new tactics development, limit application of new weapons technologies, and reduce live fire proficiency. The Threat Presentation program is assessing fully mobile threat systems; simulators with TSPI integration; upgrade Integrated Air Defense System; EC threat systems through level 4; presentation of modern adversaries; and incorporating LVC capability for advanced generation training.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Naval Special Warfare (NSW)	●	The threats provided by this range are not sufficient for training. This reduces realism, inhibits new tactics development, limits application of new weapons technologies, and reduces live fire proficiency.
	Expeditionary Warfare (EXW)	●	Same as above.
Scoring & Feedback System	Strike Warfare (STW)	●	FRTC requires more capable scoring systems that can provide accurate evaluation of the employment, targeting, and termination of CCMD required munitions, both air-to-air and air-to-surface, used during training. The capability of the current systems do not meet requirements, are not JNTC or TENA compliant, and have no automatic RTKN. This inhibits new tactics development and reduces live fire proficiency.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
Range Support	Strike Warfare (STW)	●	EW threat coverage is inadequate to provide real-world representation, and existing vintage systems are extremely manpower intensive. This reduces realism, inhibits new tactics development, limits application of new weapons technologies, and reduces live fire proficiency. Working to assess personnel turnover issues regarding EW threat systems O&M, and formalize target redesign plans that address sustainment of tactically significant targets.
	Electronic Combat (EC)	●	EW threat coverage is inadequate to provide real-world representation, and existing vintage systems are extremely manpower intensive. This reduces realism, inhibits new tactics development, limits application of new weapons technologies, and reduces live fire proficiency. Working to increase sustainment funds to address personnel turnover issues regarding EW threat systems O&M. Additional OMN support and EW emitters identified as a POM requirement.
	Anti-Air Warfare (AAW)	●	EW threat coverage is inadequate to provide real-world representation, and existing vintage systems are extremely manpower intensive. This reduces realism, inhibits new tactics development, limits application of new weapons technologies, and reduces live fire proficiency. Working to assess personnel turnover issues regarding EW threat systems O&M, and formalize target redesign plans that address sustainment of tactically significant targets.
	Naval Special Warfare (NSW)	●	Range provided threats are currently not sufficient for training. This reduces realism, inhibits new tactics development, limits application of new weapons technologies, and reduces live fire proficiency. Recommend investment in sufficient threats for mission. No completion date has been identified.
	Expeditionary Warfare (EXW)	●	Same as above.
Small Arms Ranges	Naval Special Warfare (NSW)	●	Surface Fires capabilities at the FRTC are currently constrained by limitations in the size of the closed lands and restricted airspace required in order to protect the public from hazardous activities. FRTC landspace does not meet CCMD training requirements, limits weapons type and employment tactics, restricts use of laser targeting systems, and there is insufficient area for TGM ground fire and maneuver training. These restrictions reduce realism, inhibit new tactics development, and reduce live fire proficiency. Landspace realignment as proposed in the FRTC Modernization (MILCON P-442). If approved, this will remediate small arms ranges and expand both the B-16 target area and the Dixie Valley Training Area to mitigate the capability shortfall starting in 2021.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Fallon Range Training Complex Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Strike Warfare (STW)	●	FAA altitude caps; supersonic restrictions; VFR corridor interruptions; run-in heading restrictions; and helicopter restrictions prohibit training events, segment training/reduce realism, constrain flight altitudes, inhibit new tactics development, and complicate night/all-weather training. Airspace realignment as proposed in the FRTC Modernization (MILCON P-442) if approved, will begin to mitigate the encroachment effects starting in 2021.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Airspace is used for Fallon's primary air mission and ground live fire training conflicts with airspace use. Airspace encroachment on NSW ground operations restricts training events, segments training, reduces realism, constrains flight altitudes, inhibits new tactics development, and complicates night/all-weather training. Airspace realignment as proposed in the FRTC Modernization (MILCON P-442) if approved, will begin to mitigate the encroachment effects starting in 2021.
Climate Impacts	Strike Warfare (STW)	●	The 2016-2017, Sierra Nevada snowpack is in excess of 200 percent of the annual average, with water content the highest on record. Existing water control, storage and diversion infrastructure is insufficient for containing the volume of outflow resulting from the spring runoff; flooding the FRTC B-16 and B-20 bombing ranges and causing damage to roads, targets and infrastructure. In preceding years, drought conditions in Northern Nevada increased the potential for both the frequency and intensity of wildfires. Flood or fire damage to bombing ranges results in cancellation/rescheduling of training events, and restricts or eliminates use of available infrastructure. No known resolution.
	Naval Special Warfare (NSW)	●	Same as above.
Foreign Access or Control	Strike Warfare (STW)	●	Navy is concerned with foreign intelligence collection opportunities resulting from a persistent foreign presence proximate to Navy operations, testing, and training equities ashore and at-sea. As previously stated in the 2025 Air Test and Training Range Enhancement Plan, "An emerging challenge is the increasing presence of foreign business interests in the vicinity of our sensitive test and training ranges." Foreign acquisition of real estate in close proximity to Naval Air Station Fallon and the Fallon Range Complex, a critical training and testing range, offers the ability to maintain a permanent presence near areas vital to Navy missions and national security, and facilitate an opportunity to collect critical information regarding national defense programs. Additionally, foreign investment to acquire U.S. businesses that operate near Navy activities is another avenue for establishing a permanent presence that presents very unique mission compatibility challenges. Navy actively engages in CFIUS, Fleet Commanders, Navy Region Commanders, and community planner to evaluate the security risks of foreign investment acquisitions in proximity to DoD equities. Although Navy considers this to be a potential encroachment threat for all testing and training ranges, the Navy's CFIUS Office (Proximity), in close coordination with the mission owners, has tracked and monitored foreign investment activities near Fallon and many other key ranges.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
Land Use	Strike Warfare (STW)	●	Incompatible land uses on or near the FRTC, such as mining and renewable energy projects, create a variety of encroachment activities that are harmful to the mission. Infrastructure development, cultural lighting effects on night vision devices (NVDs), power lines and telecommunications towers, spectrum encroachment, and security concerns negatively impact low altitude training and tactics for both fixed wing and rotary wing platforms. Encroachment prohibits training events, segments training, reduces realism, constrains flight altitudes, inhibits new tactics development, complicates night/all-weather training and poses a safety-of-flight hazard. Landspace realignment as proposed in the FRTC Modernization (MILCON P-442) if approved, will begin to mitigate the encroachment effects starting in 2021. Supersonic flight prohibition below 11,000 feet above MSL, as a result of noise, impacts tactical training. These restrictions affect training realism, tactics, and night/all-weather operations. No known resolution.
	Anti-Air Warfare (AAW)	●	Supersonic flight prohibition below 11,000 feet above MSL, as a result of noise, impacts tactical training. These restrictions affect training realism, tactics, and night/all-weather operations. No known resolution.
	Naval Special Warfare (NSW)	●	Same as above.

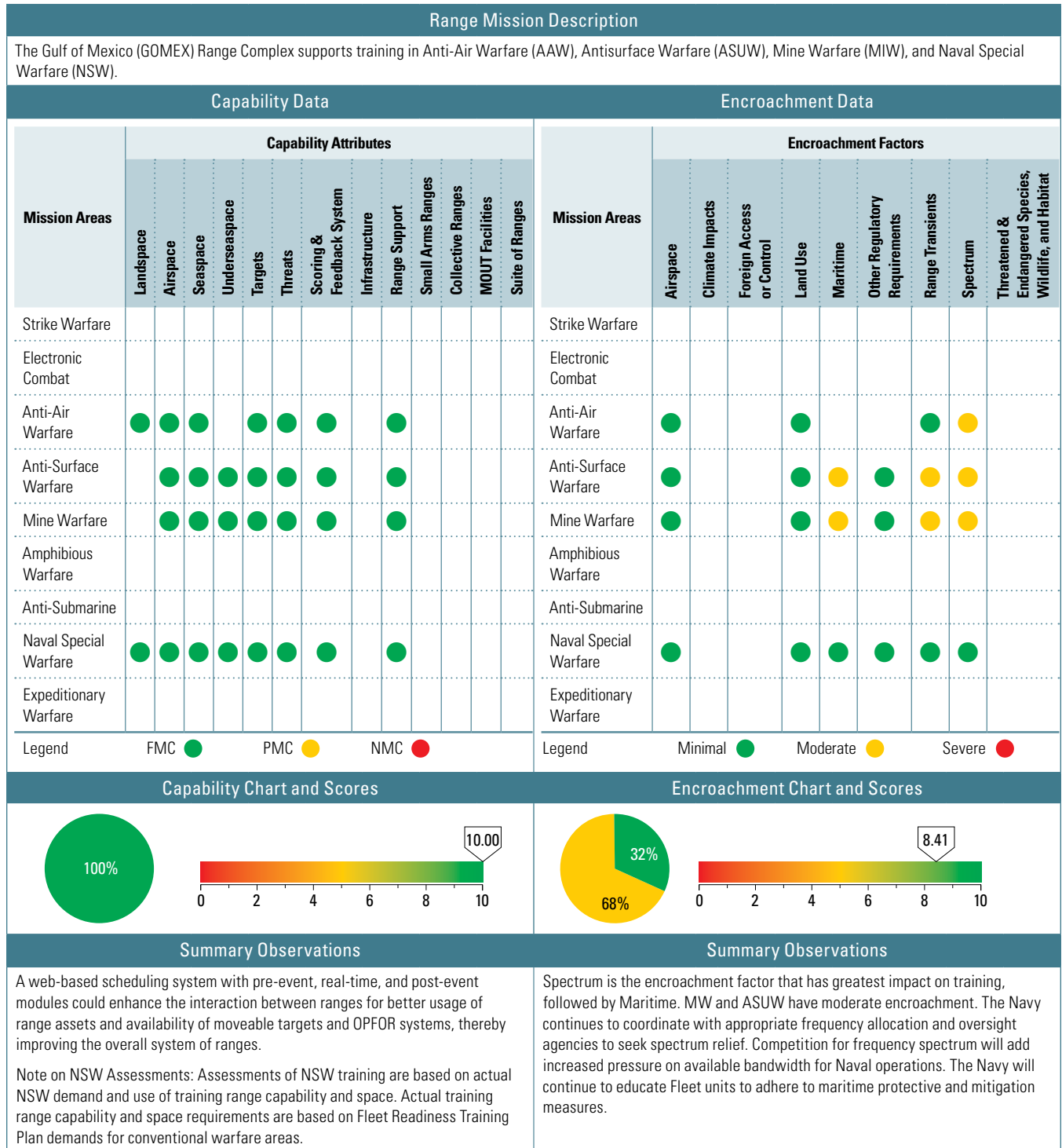
Fallon Range Training Complex Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Other Regulatory Requirements	Strike Warfare (STW)	●	Fallon range operations were designed (and are maintained) for aviation air-to-ground missions. All ranges have UXO potential. Introduction of Ground Training at Fallon ranges increases risk of a UXO incident. Impacts to training include restricted range access and areas restricted from ground use. No action planned to remedy; no known resolution.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above. Landscape realignment as proposed in the FRTC Modernization (MILCON P-442) to increase B-16 range to support NSW and EXW training if approved, will begin to mitigate the encroachment effects starting in 2021.
Range Transients	Strike Warfare (STW)	●	Range Control center must provide range clearance for livestock and occasional interloper aircraft, vehicles, and personnel. Livestock and interloper encroachment segments training and reduces realism. No known resolution.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.
Spectrum	Strike Warfare (STW)	●	<p>FRTC maintains radar and frequency band restrictions for Tactical Combat Training Systems; Electronic Warfare systems (E-3, EA-18G and others); Unmanned Aerial Systems (UAS) operations; EC threat emitter bandwidth; Link-16 time slot allocations and number of aircraft restrictions; Live Virtual Constructive network implementation; and restrictions on Red and Blue tactical training systems, all of which negatively impact FRTC training. Encroachment segments training and reduces realism, limits application of new technologies, and inhibits new tactics development. Solutions include the development of tools and products that can be used in mitigating spectrum encroachment. No completion date has been identified.</p> <p>A FRTC Spectrum Range database will be established and cross referenced to a map highlighting all EW training areas and Rights of Way (ROWs). Map is color coded by spectrum strategy game plan for the particular spectrum requirements in that local environment.</p> <p>Written spectrum doctrine will also be established to make recommendations on equipment requirements for communications providers within specific areas to mitigate spectrum encroachment. NOTE: These equipment requirements may drive up costs to the commercial communications providers (CCComm, Verizon, AT&T, et al). DoN will identify funding sources to help offset the communications provider's additional costs for spectrum de-confliction (Example: offsets might come from frequency sell off funds.)</p> <p>ROWs will be revised to include stipulation language that aligns with FRTC spectrum requirements. The revised ROWs identify sites that require a spectrum-free environment, and/or other specific requirements necessary to preserve training.</p>
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Gulf of Mexico (GOMEX) Assessment Details



Gulf of Mexico (GOMEX) Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	9.31	9.31	9.31	9.31	9.31	9.31	Encroachment Scores	9.27	8.60	8.60	8.60	8.60	8.60
The capability at GOMEX has remained steady since 2008. The score increased in 2017 due to Range Support being graded as fully mission capable based on the use of a new web-based scheduling tool, DCAST. No future changes are anticipated.							Encroachment assessments for CY2008 were different than for CY2009–2015. The algorithm for the overall assessment score for 2009–2015 was revised from the original algorithm used in 2008 to provide greater fidelity and consistency across all range complexes. Based on an improved review process and revised algorithms, the assessments for CY2009–2015 provide a more accurate assessment of encroachment. The assessments for the latter years reveal there has been little encroachment change from year to year, with relatively constant overall scores through 2015. The overall encroachment score for CY2017 dropped slightly from 2015 due to changes made in encroachment factors and definitions. The GOMEX EAP was completed in April 2017. DOI and private energy interests, are increasing as domestic energy demand builds. Naval offshore operating areas and training events may be affected. High priority areas include training ranges and sea space in and adjacent to all Navy OPAREAs, to include the eastern GOMEX oil and gas planning area. OASN(EI&E) continues to work closely with the Fleets and DOI's BOEM to resolve issues of combined use of the OCS important to both agencies. Fleet review and analysis of impacts from both oil/gas and wind energy "lease sale" areas (Mission Critical Areas) have been reviewed. The Western, Central and Eastern GOMEX oil and gas planning areas were reviewed for compatibility in 2017. DoD and DOI coordination continues. Emerging encroachment issues that may impact GOMEX Range Complex training include the establishment of OOS and acoustic sensors/ROVs, and the nomination, approval, and/or expansion of NMS, either within or in the vicinity of surface and submarine training space and transit lanes (ex. Flower Garden Banks NMS).						

Gulf of Mexico (GOMEX) Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
No comments.			

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Maritime	Anti-Surface Warfare (ASUW)	●	Maritime protective and mitigation measures undertaken in compliance with regulatory requirements have resulted in training restrictions that reduce training flexibility and ultimately reduce training realism. All at-sea training is impacted to some degree; impacts are most significant to integrated warfare training using active underwater acoustic sources. The Navy and NMFS have developed science based protective and mitigation measures that adequately protect marine species while accommodating military readiness activities. The Navy continues to develop Environmental Impact Statements and obtain permits and authorizations for its range complexes to ensure military training complies with applicable laws and regulations. Litigation risks remain a concern, entailing the potential to delay or further restrict training, despite the protective and mitigation measures applied by the Navy in compliance with the MMPA and ESA. Endangered species/critical habitat encroachment has created avoidance areas that have resulted in some reduction of training days and the prohibition of certain training events. This area is relatively small in scope; however, if these types of restrictions were applied to other species/areas, there would be significant impacts to readiness through reduction in range access, segmentation of training/reduction in realism, limits on the application of new technologies, raised flight altitudes, reduced live fire proficiency, increased personnel tempo, and increased O&M costs. The Navy continues to invest in marine mammal research; rely on scientifically valid empirical data results as the basis of marine mammal mitigation development; and factor mitigation effectiveness into permit requests. Recommend continuing the education of Fleet units to adhere to the maritime protective and mitigation measures and public education outreach efforts. Navy's authorizations under the MMPA and ESA include an adaptive management approach that includes continually evaluating existing mitigation measures for their potential impacts on training. If impacts on training from mitigation measures are identified and documented, Navy will raise these impacts with NMFS for resolution during an annual adaptive management review process.
	Mine Warfare (MW)	●	Same as above.

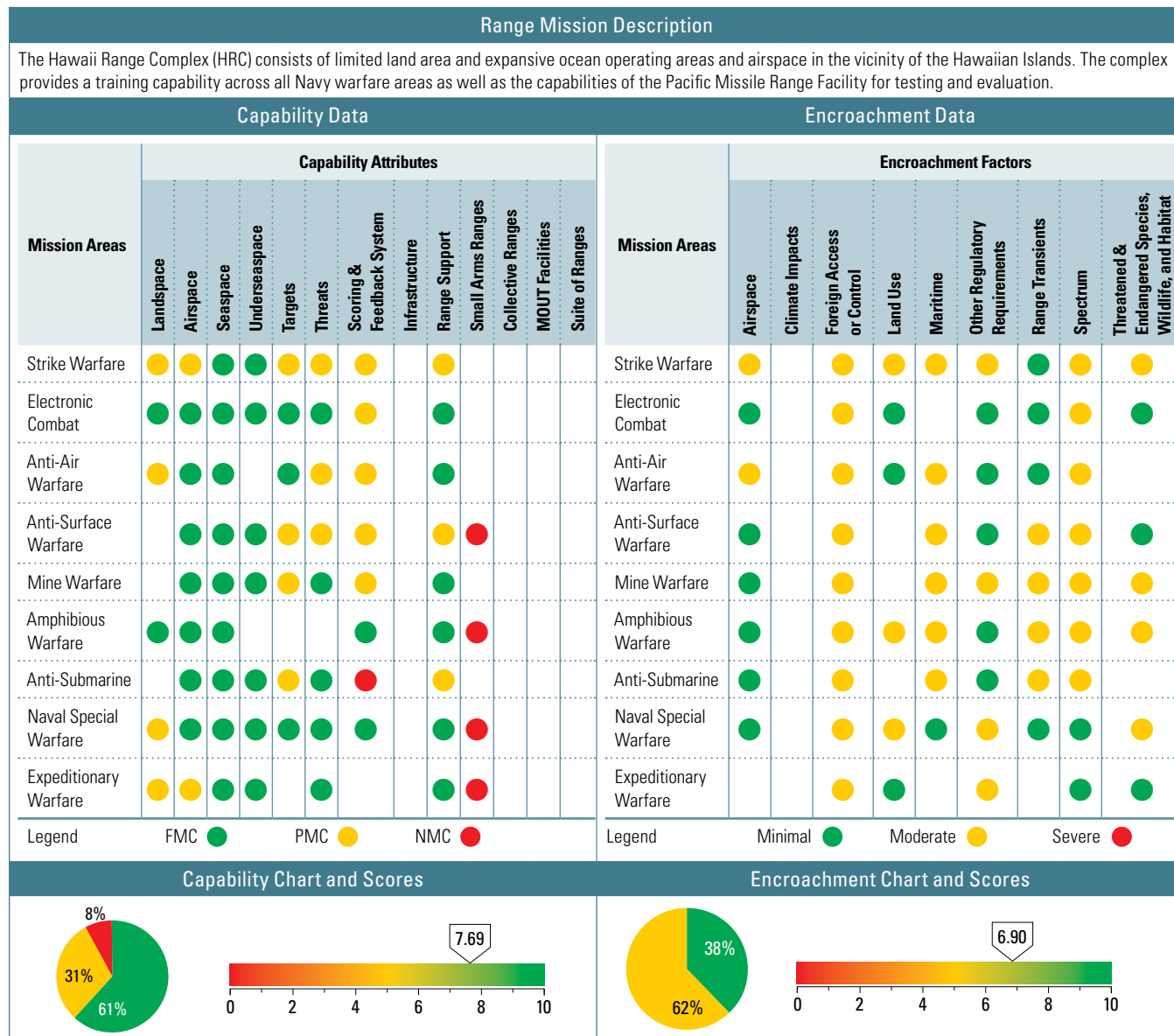
Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)**Gulf of Mexico (GOMEX) Detailed Comments****Encroachment Observations**

Factors	Assigned Training Mission	Score	Comments
Range Transients	Anti-Surface Warfare (ASUW)	●	Range transients, involving commercial shipping, commercial fishing, and private pleasure boating, encroach on training, either by delaying events or forcing relocation to less than optimum locations. Commercial vessel and recreational vessel encroachment creates avoidance areas, segments training, and reduces realism. The Navy will continue to pursue opportunities to inform industry and the public of the impact of range transient encroachment on at-sea OPAREAS and Navy readiness.
	Mine Warfare (MW)	●	Same as above.
Spectrum	Anti-Air Warfare (AAW)	●	Employment of Link 16 is restricted. These restrictions limit spectrum operations and prohibit certain training events, segment training/reduce realism, reduce training days, limit application of new weapons technologies, and inhibit new tactics development. The Navy continues to coordinate with appropriate frequency allocation and oversight agencies to seek spectrum relief and to develop encroachment strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies. Competition for frequency spectrum will add increased pressure on available bandwidth for Naval operations.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.

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Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Hawaii Assessment Details



Hawaii Assessment Details

Summary Observations							Summary Observations						
The Capability Attribute most impacting range mission performance is Range Support. The Mission Area most severely impacted is strike warfare. There is no immediate change in projected status. Assessments of NSW training are based on actual NSW demand and use of training range capability and space. Actual Training range capability and space requirements are based on Fleet Readiness Training Plan demands for conventional warfare areas.							All Mission Areas, except NSW & EXW, have substantial encroachment. There are significant concerns with ability avoid impact from incompatible offshore wind development despite consistent support from Navy senior operational leadership. Note on NSW Assessments: Assessments of NSW training are based on actual NSW demand and use of training range capability and space. Actual Training range capability and space requirements are based on Fleet Readiness Training Plan demands for conventional warfare areas.						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	7.59	7.76	7.84	7.84	8.02	7.37	Encroachment Scores	8.96	8.44	8.44	8.36	8.23	8.15
In 2008 MIW Targets and Scoring & Feedback were assessed as Red. These changed to Yellow in 2009, and then Green in 2010, as a result of range updates for MIW identified by COMPACFLT. In 2013, STW Scoring and Feedback was assessed as Yellow by COMPACFLT. Scoring and Feedback for ASW has gone from green to yellow as PMRF BARSTUR range underwater cables and hydrophones require funding and scheduling for repairs and replacement to sustain capability to support ASW training. Targets for ASW is yellow; the replacement for the MK-30 must remain on track. EMATTS (MK-39) can't support all ASW training requirements, and improvements in sensor system capabilities cannot be fully exploited in training against the MK-39. The DCAST web based scheduling tool has been installed for FACSFAC PH, and is planned for PMRF at an undetermined date. EW Threats went from 2 to 1, and scoring and feedback from 1 to 2. The number and type of emitters support the EW training requirement, but lack an automatic EW scoring system. AAW Airspace went from 1 to 2; there is no AAW airspace over land area. Land area went from 2 to 1; land area isn't available and doesn't meet AAW requirements, but the impact is minimal. Other range complexes are assigned to meet the requirement. ASUW Scoring and Feedback went from 1 to 2; as a result of a lack of comprehensive TSPI instrumentation and scoring and feedback system for FAC/FIAC training requirements. MW Scoring and Feedback went from 1 to 2 because the range lacks instrumented mine shapes. AMW Airspace went from 1 to 2 because of insufficient airspace over land. There is no supersonic flight in AMW airspace.							Encroachment assessments for CY2008 were different than for CY2009–CY2011. The algorithm for the overall assessment score for 2009–2011 was revised from the original algorithm used in 2008 to provide greater fidelity and consistency across all range complexes. Based on an improved review process and revised algorithms, the assessments for CY2009–CY2011 provide a more accurate assessment of encroachment. The assessments reveal there have been few encroachment changes from year to year, with relatively constant overall scores from CY2009–CY2014, but there is a slow downward trend. The latest Hawaii RCMP update began in April 2017. While it is fleet training focused, it will identify other current and projected developments that will encroach on fleet training. The NMFS proposal for Hawaiian Monk Seal (E) critical habitat designation has been promulgated. Three INRMPS in the HRC provide benefit under ESA 4(a)(3): MCBH (500 yard marine buffer zone around Mokapu peninsula, Puuloa Training facility on the Ewa coastal plain; JBPHH (Nimitz and White Plains, Naval Defensive Sea Area, and Barbers Point Underwater Range & Ewa training minefield; and PMRF (Kaula Islet and coastal and marine areas out to 10 meter depth around the Island of Niihau. NOAA has also determined that the benefits (National Security interests) outweigh the benefits of designation of Critical Habitat: Kingfisher Underwater Training area, PMRF Offshore, Puuloa Underwater Training Range and Shallow Water Minefield off Kahoolawe. Navy continues to request a national security exclusion from critical habitat designation for Kaula, Barbers Point Underwater Range and Ewa Training Minefield. These exclusions have significantly reduced the potential compromise of training on the HRC and exemplify the direct benefit of cooperative conservation efforts.						
Emerging Encroachment Challenge													
The construction and operation of the congressionally-mandated Homeland Defense Radar-Hawaii (HDR-H), while not incorporated into the encroachment score for this range, has the potential to significantly encroach on all training and testing activities and scheduling at HRC. If constructed and operated on PMRF with a 24/7 CONOPS, the HDR-H, required by Congress, will severely encroach on all of PMRF testing and training activities to the point that most can no longer be supported. Without considerable coordination within all levels of DoD, the viability of PMRF as a future Navy testing and fleet training asset is yet to be determined. The HDR-H to be constructed at Main Base/Barking Sands or Makaha Ridge remote site is currently mandated to be operational 24/7. The power and logistical requirements of the system exceed the current infrastructure to support the system at either location, and the power of the system will critically impact all the current and future training and testing missions. Operation of the HDR-H may prohibit some activities and capabilities. Training and test activities that do continue will experience increased mission conflict due to compression of available range time. The HDR-H program is undergoing NEPA analysis with MDA as the lead Agency, on a schedule mandated by Congress in the current NDAA and PMRF and CPF will be directly engaged in the process to insure that all conflicts and concerns are considered and incorporated in the analysis.													

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Hawaii Detailed Comments

Capability Observations			
Attributes	Assigned Training Mission	Score	Comments
Landscape	Strike Warfare (STW)	●	Unable to conduct low-level ingress over land to an air-to-ground range area with a realistic strike package. This reduces realism and inhibits tactics development. There is no solution due to unavailability of land and airspace.
	Anti-Air Warfare (AAW)	●	Airspace over land is required for ACM training. There is no landspace beneath any AAW training space in the HRC. This reduces realism by preventing detection and targeting of terrain following aircraft. There is no land/air space is available to solve this problem.
	Naval Special Warfare (NSW)	●	The range lacks maneuver space with a beachfront, live fire areas, and a MOUT. This segments training, reduces realism, inhibits tactics, and reduces live fire proficiency. There is no solution to this shortfall due to the lack of available land.
	Expeditionary Warfare (EXW)	●	Beachfront requirements are partially met, but contiguous maneuver space does not meet requirements. These limitations segment training, reduce live-fire proficiency, prohibit certain training events, and reduce realism. No solution is feasible due to a lack of available land.
Airspace	Strike Warfare (STW)	●	Unable to conduct low-level ingress over land to an air-to-ground range area with a realistic strike package. This reduces realism and inhibits tactics development. There is no solution due to the unavailability of land and airspace.
	Expeditionary Warfare (EXW)	●	The airspace over the range land is insufficient. This limitation reduces realism and inhibit tactics development. No solution is feasible due to the unavailability of land and airspace.
Targets	Strike Warfare (STW)	●	There is no raked, strafe, structural, revetted, moving, or urban targets on Kaula Island. Additionally, the Island does not meet requirements for live fire and realistic strike missions. These limitations reduce realism and live fire proficiency. Kaula Island is inert only with limited acreage and capability to support targets. Recommend coordinating with the Army to upgrade PTA targets to meet training requirements.
	Anti-Surface Warfare (ASUW)	●	Basic level training target requirements are green, but intermediate level training target requirements are not available in sufficient quantity or variety. This reduces training realism.
	Mine Warfare (MW)	●	The existing mine training field does not realistically portray the threat environment. This reduces realism, inhibits tactics, and limits application of new weapons technologies. The situation will get worse if improvements are not made before OMCM systems are deployed. The anticipated deployment of new training mine fields are to be determined.
	Anti-Submarine (ASW)	●	MK-30 targets and MK-39 EMATs reproduce existing and anticipated threats, but they do not provide accurate responses to waveforms produced by the MH-60 ASQ-22 or AN-SQS-56 sonars. MK-30 Mod 1 targets are approaching the end of their service life; MK-30 Mod 2 program was cancelled in 2012, leaving only a partial Mod 2 capability in Hawaii. These limitations reduce realism and inhibit tactics development. ASW targets capable are required to support the full spectrum of platform and sensor training requirements.
Threats	Strike Warfare (STW)	●	Adequate quantity and types of threat OPFOR are not available. This reduces realism and inhibits tactics development. Recommend acquiring EC systems that provide a high density, multi-threat axis capability. No completion date has been identified.
	Anti-Air Warfare (AAW)	●	The number and types of threat OPFOR aircraft and EW systems are inadequate to meet training needs. Where feasible, Fleet aircraft are used to fill the role as OPFOR. This shortfall reduces training realism, inhibits tactics development, and increases O&M costs where Fleet aircraft fill the OPFOR role. The recommended actions are to increase the number and types of OPFOR aircraft to levels of current and emerging real world potential adversaries and to invest in EW threat systems to provide reactive, coordinated all-axis threats with operational command and control. No completion date has been identified.
	Anti-Surface Warfare (ASUW)	●	For OPFOR aircraft, the number and types are inadequate to meet training needs. Where feasible, Fleet aircraft are used to fill the role as OPFOR. OPFOR major surface combatants are provided by Fleet or Allied ships tasked to participate as OPFOR. Small surface OPFOR, which replicate fast attack craft, are available from PMRF, but not in sufficient numbers to replicate large numbers of attacking small craft. This shortfall reduces training realism, inhibits tactics development, and increases O&M costs, where Fleet aircraft and ships fill the OPFOR role. The recommended action is to increase the number and fidelity of OPFOR aircraft and missile threats.

Hawaii Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Scoring & Feedback System	Strike Warfare (STW)	●	Instrumented scoring and debriefing capabilities are not available; and performance, scoring, and evaluation of training is required for effective training. This inhibits tactics development and reduces live fire proficiency.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	The system lacks required capacity and needs upgrades to prevent obsolescence. This lack of adequate instrumentation reduces the overall effectiveness of flights due to lower quality debrief information.
	Anti-Surface Warfare (ASUW)	●	Comprehensive TSPI instrumentation is required in support of Counter- FAC/FIAC tactics and training requirements. However, the existing system lacks required capacity and needs upgrades to prevent obsolescence.
	Mine Warfare (MW)	●	The range mine fields lack instrumentation and mine shapes are not instrumented. The recommended action is to invest in additional or new equipment to upgrade current systems. No completion date has been identified.
	Anti-Submarine (ASW)	●	BARSTUR is degrading due to hydrophone array failures. Efforts to extend BARSTUR service life were completed in 2011; four of five arrays were repaired, and subsequently one array has failed. Refurbishment/ replacement of the aging BARSTUR hydrophone array is required before critical failure.
Range Support	Strike Warfare (STW)	●	Degraded PMRF radars, communications, and network scheduling systems need replacements or upgrades to maintain more safe and effective UAS and STW training. PMRF radar systems facilitate STW training into and out of the PTA range and during fleet training events. UAS operations are limited by airspace restrictions and track integration with fleet training events, and STW training is degraded due to sub-standard PMRF radar monitoring and control.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
Small Arms Ranges	Anti-Surface Warfare (ASUW)	●	No Navy range provided crew-served weapons and small arms tactical training range in the HRC. All SUW and NECC forces have enduring small arms and crew-served weapons FRTP training requirements. This degrades readiness, reduces realism, inhibits tactics, limits application of new weapon technologies, reduces live fire proficiency, increases personnel optempo, and increases O&M costs. Hawaii stationed units must spend PERSTEMPO and limited travel to attain this training elsewhere, or waive requirements, which results in degraded combat readiness.
	Amphibious Warfare (AMW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Airspace	Strike Warfare (STW)	●	Due to competition for the same airspace and scheduling conflicts, at times, usage of the airspace is limited and flights may be cancelled. In general, commercial and private aviation conflicts with Naval operations throughout the range complex. In addition, there is increased demand for PMRF airspace by non-Navy air units to conduct training and testing exercises that cannot be performed on other DoD ranges due to WDZ footprints. Encroachment prohibits certain training events in the area. Commercial traffic in the airspace causes delays and segments training. PMRF continues to coordinate scheduling of airspace with primary range users and the FAA.
	Anti-Air Warfare (AAW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Hawaii Detailed Comments

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comment
Foreign Access or Control	Strike Warfare (STW)	●	Navy is concerned with foreign intelligence collection opportunities resulting from a persistent foreign presence proximate to Navy operations, testing, and training equities ashore and at-sea. As previously stated in the 2025 Air Test and Training Range Enhancement Plan, "An emerging challenge is the increasing presence of foreign business interests in the vicinity of our sensitive test and training ranges." Foreign acquisition of real estate in close proximity to Hawaii Range Complex, a critical training and testing range, offers the ability to maintain a permanent presence near areas vital to Navy missions and national security, and facilitate an opportunity to collect critical information regarding national defense programs. Additionally, foreign investment to acquire U.S. businesses that operate near Navy activities is another avenue for establishing a permanent presence that presents very unique mission compatibility challenges. Navy actively engages in CFIUS, Fleet Commanders, Navy Region Commanders, and community planner to evaluate the security risks of foreign investment acquisitions in proximity to DoD equities. Although Navy considers this to be a potential encroachment threat for all testing and training ranges, the Navy's CFIUS Office (Proximity), in close coordination with the mission owners, has tracked and monitored foreign investment activities near the Hawaii Range Complex and many other key ranges.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.
Land Use	Strike Warfare (STW)	●	STW range is insufficient in size to support all requirements. Land withdrawal/procurement is problematic due to development/other factors. Insufficient range size segments training, reduces realism, prohibits certain training events, limits use of advanced technologies. There is no solution at this time.
	Amphibious Warfare (AMW)	●	With the passage of Kauai County Bill 2491, a portion of the Kauai Island population may attempt to close out seed companies that operate on the west side. The result could be that the Agricultural Preservation Initiative would be vacated and the land, now agricultural, would be vulnerable to prime development. Portions of this land are adjacent to PMRF. This limitation would create avoidance areas, prohibit certain training and test events, limit the use of new technologies, restrict flight altitudes, and inhibit new tactics development. County bill has been overruled at the state level. The Navy continues to monitor the situation, and will engage State and county officials in any decision process to convert the land.
	Naval Special Warfare (NSW)	●	The conversion of Iroquois Point/Puuloa housing to private sector housing creates a public access problem when the Navy must clear the shoreline and waters for training or when high value units (HVU) enter the harbor. This limitation creates avoidance areas, reduces usage days, prohibits certain training events, and inhibits tactics development. PMRF continues to work with the private housing partner, city, and State officials to establish policies and procedures to allow public access to the beach.

Hawaii Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Maritime	Strike Warfare (STW)	●	Maritime protective and mitigation measures undertaken in compliance with regulatory requirements have resulted in training restrictions that reduce training flexibility, force segmented training, and ultimately reduce training realism. All at-sea training is impacted to some degree; impacts are most significant to integrated warfare training using active underwater acoustic sources or in-water explosive ordnance. The Navy and NMFS have developed science based protective and mitigation measures that adequately protect marine species while accommodating military readiness activities. The Navy continues to develop Environmental Impact Statements and obtain permits and authorizations for its range complexes to ensure military training complies with applicable laws and regulations. Litigation risks have materialized for specific temporal and aerial exclusion areas that may result in the potential to delay or further restrict training, despite the protective and mitigation measures applied by the Navy in compliance with the MMPA and ESA. Endangered species/critical habitat encroachment created avoidance areas that resulted in some reduction of training days, and the prohibition of certain training events. This area is relatively small in scope. However, if these types of restrictions were applied to other species/areas there would be significant impacts to readiness through reduction in range access, segmentation of training/reduction in realism, limits on the application of new technologies, raised flight altitudes, reduced live fire proficiency, increased personnel tempo, and increased O&M costs. The Navy continues to invest in marine mammal research; rely on scientifically valid empirical data as the basis of marine mammal mitigation development; factor mitigation effectiveness into permit requests and educate Fleet units to adhere to the maritime protective and mitigation measures and public education outreach efforts. Navy's authorizations under the MMPA and ESA include an adaptive management approach that includes continually evaluating existing mitigation measures for their potential impacts on training. If impacts on training from mitigation measures are identified and documented, Navy will raise these impacts with NMFS for resolution during an annual adaptive management review process. The Navy is currently preparing environmental compliance documentation to renew the MMPA and ESA authorizations which will consider any impacts on training stemming from existing mitigation measures and propose changes as warranted.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
Other Regulatory Requirements	Strike Warfare (STW)	●	To comply with the MMPA and the ESA, the Navy will limit Kaula Island targeting for inert air-to-surface weapons delivery to the southeast tip of the island. Restrictions create large avoidance areas, reduce training days, prohibit certain training events, and reduce range access. No remedy anticipated or planned. There are cultural sites and resources throughout the Hawaii Range Complex. Some locations, Kaula Islet in particular, are coming under increased scrutiny by Native Hawaiian activists. The presence of cultural resources within the training area creates large avoidance areas, prohibits certain training events, reduces range access, segments training and reduces realism, inhibits new tactics development, and greatly increases O&M costs. The Military Services have implemented training procedures to protect and conserve the cultural resources in the Hawaii Range complex.
	Mine Warfare (MW)	●	Navy personnel may encounter health risks when coming in contact with Pearl Harbor waters or harbor sediments in areas near sources of runoff and after storms. These limitations create avoidance areas, prohibit certain training activities, reduce range access, and increase costs or risks. Naval Facilities Hawaii reduces runoff into Pearl Harbor estuary by operating a water treatment plant to handle domestic and industrial waste water. Navy divers and personnel conduct training avoiding contact with Pearl Harbor estuary runoff, harbor sediments, and outfalls within the waters of NDSA.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

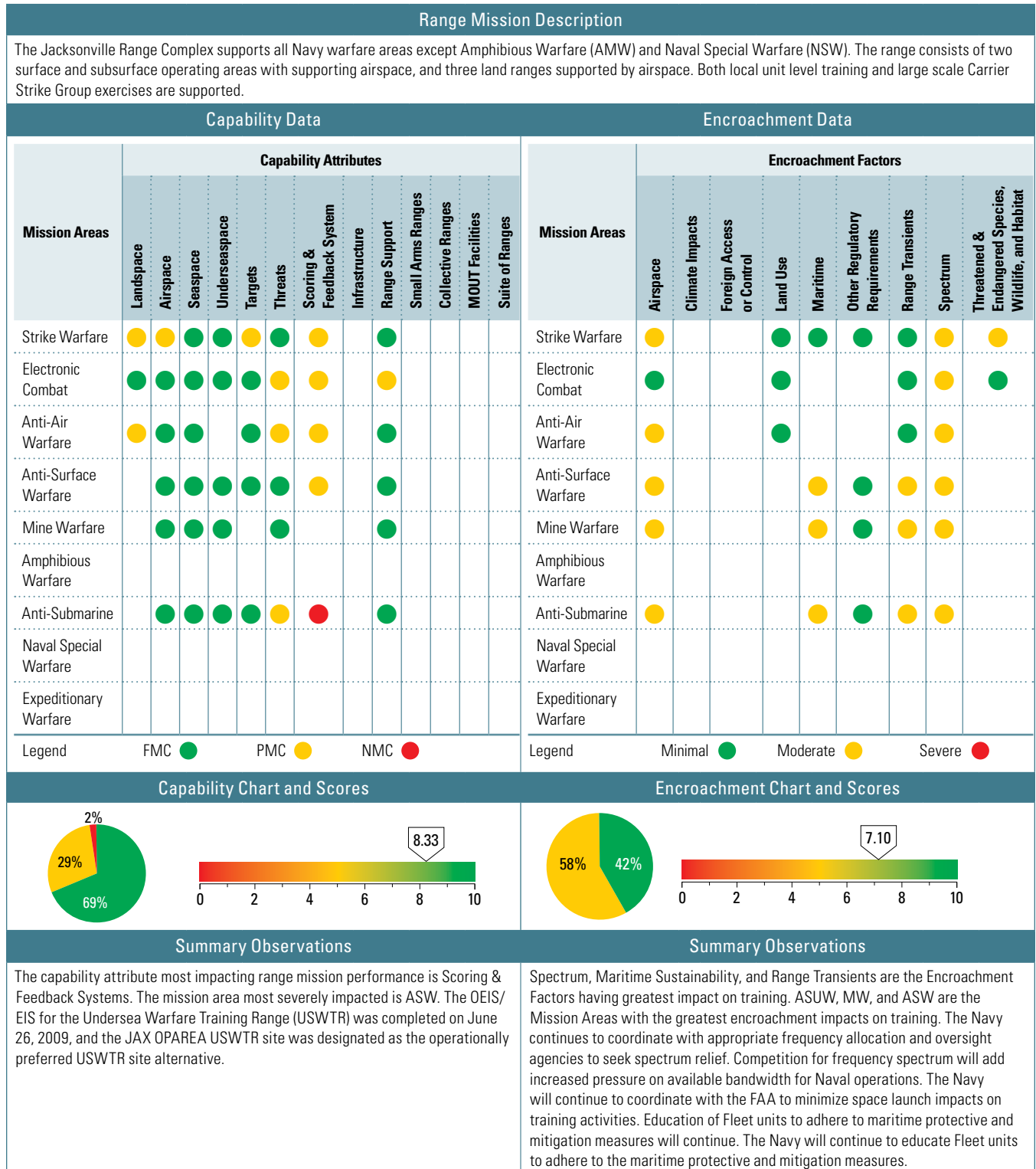
Hawaii Detailed Comments

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comment
Range Transients	Anti-Surface Warfare (ASUW)	●	Range transients involving commercial tour and dive boats, sport and private fishing vessels, and sail and motor pleasure craft encroach on training, either by delaying events or forcing relocation to less than optimum times and locations. Commercial and recreational vessel encroachment creates avoidance areas and segments training, reducing realism. The Navy will continue to pursue opportunities to inform industry and the public of the impact of range transient encroachment on At Sea OPAREAS and Navy readiness.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
Spectrum	Strike Warfare (STW)	●	Employment of Link 16 is restricted. Restrictions limit spectrum operations and prohibit certain training events, segment training/reduce realism, reduce training days, limit application of new weapons technologies, and inhibit new tactics development. The Navy continues to coordinate with appropriate frequency allocation and oversight agencies to seek spectrum relief and to develop encroachment strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies. Competition for frequency spectrum will add increased pressure on available bandwidth for Naval operations.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Strike Warfare (STW)	●	Restrictions center around the protection of numerous migratory birds on Kaula Island. Rather than implement costly mitigation measures, operations have been modified to minimize impacts to protected species. These restrictions have been self-imposed by the Navy and without any direction of the regulators. Restrictions create large avoidance areas, reduce training days, prohibit certain training events, and reduce range access. To comply with the MMPA and the ESA, the Record of Decision (ROD) concluded that the Navy “will limit Kaula Island targeting for air to surface weapons delivery to the southeast tip of the island” and only seasonally when marine mammals are not present. No remedy is anticipated or planned. In addition, since finalization of HRC/PMRF FEIS/OEIS, Federal and State environmental regulators and NGOs are focusing even more on populations and habitat, both land and marine, on/around Kaula Island. Sea bird population surveys by vessel were conducted by USN contractors and staff during the week of July 20, 2009. This is the first such survey in more than 10 years and required pursuant to HRC/PMRF FEIS/OEIS. Future, potential impacts based on such studies cannot be predicted. Possible efforts to impose further restrictions on usage are uncertain.
	Mine Warfare (MW)	●	Restrictions center around the protection of numerous species including the Hawaiian monk seal, Hawaiian hoary bat, green sea and hawksbill turtles, and migratory birds near or on Kaula Islet, PMRF, and JBPHH. Operations have been modified to minimize impacts to protected species. These restrictions have been self-imposed by the Navy and without any direction of the regulators. Restrictions create large avoidance areas, reduce training days, prohibit certain training events, and reduce range access. To comply with the MMPA and the ESA, the ROD concluded that the Navy “will limit Kaula Island targeting for air to surface weapons delivery to the southeast tip of the island” and only seasonally when marine mammals are not present. No remedy is anticipated or planned. In addition, since finalization of HRC/PMRF FEIS/OEIS, Federal and State environmental regulators and NGOs are focusing even more on populations and habitat, both land and marine, on/around Kaula Island. Sea bird population surveys by vessel were conducted by USN contractors and staff during the week of July 20, 2009. This is the first such survey in more than 10 years and required pursuant to HRC/PMRF FEIS/OEIS. Future, potential impacts based on such studies cannot be predicted. Possible efforts to impose further restrictions on usage are uncertain.
	Amphibious Warfare (AMW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.

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Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Jacksonville Assessment Details



Jacksonville Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	7.73	7.61	7.61	7.74	7.74	7.74	Encroachment Scores	8.51	7.50	7.50	7.38	7.75	7.75
<p>The STW airspace re-evaluated from Green in 2008 to Yellow in 2009 and beyond. The value was changed from Green to Yellow for consistency in impacts for all Atlantic ranges and was based on a review by Fleet Forces (USFF) and a determination that airspace restrictions to and from Jacksonville were not significantly different than access at VACAPES and Cherry Point. MW Targets and Scoring & Feedback changed to White based on USFF evaluation that TSPI Instrumented scoring data and dedicated mine target shapes are not required in the JAX OPAREA. Scoring improved in 2017 due to Range Support being graded as fully mission capable based on the use of a new web-based scheduling tool, DCAST. Scoring is expected to further improve with the completion of USWTR (Construction is set to begin in 2017; IOC for fleet testing is projected in 2019).</p>							<p>Encroachment assessments for CY2008 were different than for CY2009–2015. The algorithm for the overall assessment score for 2009–2015 was revised from the original algorithm used in 2008 to provide greater fidelity and consistency across all range complexes. Based on an improved review process and revised algorithms, the assessments for CY2009–2015 provide a more accurate assessment of encroachment. The assessments for the latter years reveal there has been little encroachment change from year to year, with relatively constant overall scores through to 2017. The overall encroachment score for CY2017 dropped slightly from 2015 due to changes made in encroachment factors and definitions. As population growth continues in the Jacksonville areas, there will be increased competition for spectrum bandwidth as G3 and G4 telecommunications increase. Spectrum competition may add increased pressure on the Navy's ability to use radar, communications, EC, and other military systems. The JAX OPAREA EAP was completed in May 2017. DoI and private energy interests, to include foreign investment and acquisition in the vicinity of the OCS, are increasing as domestic energy demand builds. Naval offshore operating areas and training events may be affected. High priority areas include training ranges and sea space in and adjacent to all Navy OPAREAs, to include the South Atlantic oil and gas planning areas. OASN(EI&E) continues to work closely with the Fleets and DoI's BOEM to resolve issues of combined use of the OCS important to both agencies. Fleet review and analysis of impacts from both oil/gas and wind energy "lease sale" areas have been reviewed and forwarded to OSD. DoD and DoI coordination continues. South Carolina and Georgia state and federal officials are planning to designate offshore wind areas for lease to developers of commercial scale offshore wind farms. Future wind farms may have the potential to affect military operations in the Jacksonville Range Complex; however, good coordination among Federal and state task force representatives and DoD and Navy planners should limit any impact to maritime training. Recent federal executive action has reopened the Atlantic to oil/gas development; this issue should remain in the Navy's purview as the potential exists that it, along with other areas within the Jacksonville Complex, may be considered for exploration and development. Mission Critical Areas have been identified and continued coordination with OSD and BOEM should help to mitigate impacts to Navy training and certification. Emerging encroachment issues that may impact Jacksonville Range Complex training include establishment of OOS and acoustic listening devices/ROVs; nomination, approval, and/or expansion of NMS and Monuments, either within or in the vicinity of air, surface and submarine training space and transit lanes; and the development of offshore hydrokinetic energy infrastructure. Development of Spaceport, Camden County, could influence local USN activities in adjacent Warning Area.</p>						

Jacksonville Detailed Comments

Capability Observations



Attributes	Assigned Training Mission	Score	Comments
Landscape	Strike Warfare (STW)		Available landspace does not fully support size or topography requirements for placement of required number of targets. The use of live ordnance is supported only at Pinecastle, and the small size of the range prohibits use of some weapons systems (Hellfire II/F-35 LRD). The use of flares is restricted, and no land area supports NSFS training. This prohibits certain training events, reduces realism, and increases personnel optempo. Navy is assessing east coast options to support standoff weapons training.
	Anti-Air Warfare (AAW)		Range landspace does not fully support size or topography requirements or support surface combatant detection of aircraft over land, and the use of flares is restricted. This prohibits certain training events, reduces realism, and increases personnel optempo. Overland ACM training is conducted at Fallon Range Training Complex. There are no additional land options available.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Jacksonville Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Airspace	Strike Warfare (STW)	●	The range land area and its associated restricted airspace areas are adjacent to JAX at-sea airspace, requiring MOA for transition between the seaspace and landspace areas. OPAREAs lack characteristics for realistic tactical approaches and do not support the area size to meet minimum training requirements. The size of the Pinecastle Range Complex (PRC) airspace is too small to conduct threat representative tactics, to include EW presentations. This transit reduces realism, inhibits new tactics development, and reduces live fire proficiency. There are no local options for increasing land availability. Navy will consider options to designate new SUA that enhances readiness training value.
Targets	Strike Warfare (STW)	●	There are no Land Attack Cruise Missile (LACM) or NSFS land area targets, and other targets lack infrared signatures. This prohibits certain training events, reduces realism, limits application of new weapon technologies, inhibits tactics development, reduces live fire proficiency, increases personnel optempo, and increases O&M costs.
Threats	Electronic Combat (EC)	●	EC threat representation does not fully support EC threat levels 3 or 4 for required mission areas. The existing instrumentation systems are becoming obsolete and unsupportable through the FYDP. No instrumentation systems provide LVC capability. TCTS Increment II is the identified solution; however, the projected number of pods is well short of the requirement. This prohibits certain training events, reduces realism, limits application of new weapon technologies, inhibits tactics development, reduces live fire proficiency, increases personnel optempo, and increases O&M costs.
	Anti-Air Warfare (AAW)	●	The range has no helicopter or supersonic threat OPFOR. This reduces realism, increases personnel optempo, and increases O&M costs.
	Anti-Submarine (ASW)	●	The range has limited dedicated live submarines, surface ships, or aircraft to serve in the OPFOR role. This prohibits certain training events, reduces realism, inhibits tactics, increases personnel optempo, and increases O&M costs.
Scoring & Feedback	Strike Warfare (STW)	●	The range has incomplete TSPI & EC&C OPAREA coverage, due to line of sight issues with the Fleet operating over the horizon, and is in need of scoring, RTKN and M&S systems. TCTS II is the POR that will deliver M&S to aircraft; however, the number of pods scheduled for delivery is well short of the demand signal. This increases personnel optempo and increases O&M costs.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	OPAREA coverage is not complete, Modeling & Simulation is inadequate, and there is no RTKN. Existing instrumentation systems are not supportable through the FYDP. This reduces realism, inhibits tactics, increases personnel optempo, and increases O&M costs.
	Anti-Surface Warfare (ASUW)	●	Same as the Strike Warfare category.
	Anti-Submarine (ASW)	●	An underwater tracking range is funded and under construction to support ASW event tracking, scoring capability, M&S, and post mission feedback. Full operational capability is scheduled for FY2023.
Range Support	Electronic Combat (EC)	●	An Electronic Combat Range Support capability exists; however, everyday support is not funded. Funding is only provided during the execution of Large Force Exercises.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Strike Warfare (STW)	●	During space launches at Cape Canaveral, the FAA closes southern portions of the Jacksonville OPAREA and associated airspace, depending on launch parameters. Closing portions of the SUA and OPAREA impacts several warfare areas that use the SUA and OPAREAs. Airspace restrictions create avoidance areas, reduce training days, reduce range access, segment training/reduce realism, increase personnel tempo, and increase O&M costs. The Navy will continue to coordinate with the FAA to minimize space launch impacts on training activities.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.

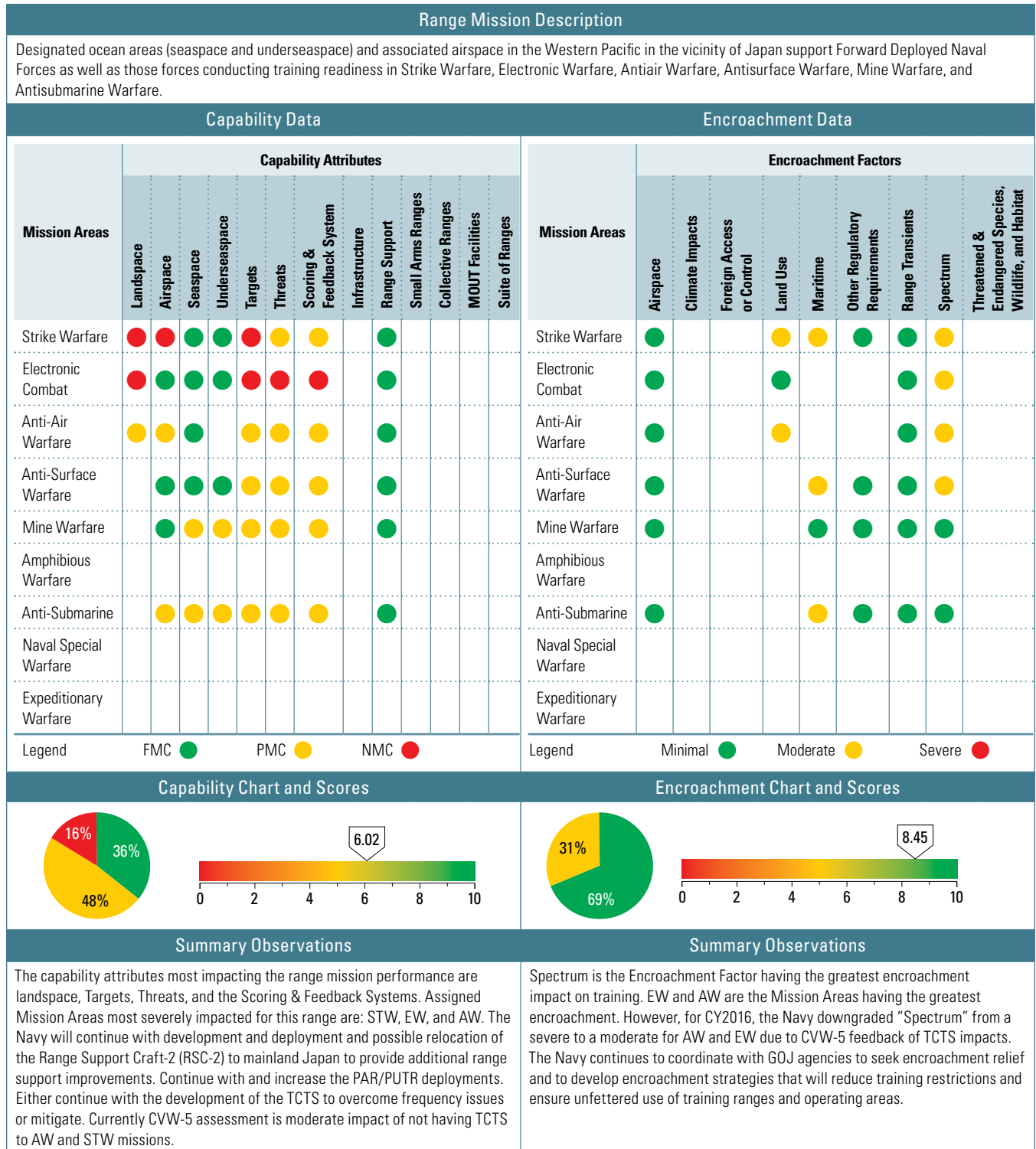
Jacksonville Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Maritime	Anti-Surface Warfare (ASUW)	●	Maritime protective and mitigation measures undertaken in compliance with regulatory requirements have resulted in training restrictions that reduce training flexibility and ultimately reduce training realism. All at-sea training is impacted to some degree; impacts are most significant to integrated warfare training using active underwater acoustic sources. The Navy and NMFS have developed science based protective and mitigation measures that adequately protect marine species while accommodating military readiness activities. The Navy continues to develop Environmental Impact Statements and obtain permits and authorizations for its range complexes to ensure military training complies with applicable laws and regulations. Litigation risks remain a concern, entailing the potential to delay or further restrict training, despite the protective and mitigation measures applied by the Navy in compliance with the MMPA and ESA. Endangered species/critical habitat encroachment from the North Atlantic right whale has created avoidance areas that have resulted in some reduction of training days and prohibits certain training events. This area is relatively small in scope; however, if these types of restrictions were applied to other species/areas, there would be significant impacts to readiness through reduction in range access, segmentation of training/reduction in realism, limits on the application of new technologies, raised flight altitudes, reduced live fire proficiency, increased personnel tempo, and increased O&M costs. The Navy will continue to invest in marine mammal research; rely on scientifically valid empirical data results as basis of marine mammal mitigation development; factor mitigation effectiveness into permit requests; and continue education of Fleet units to adhere to the maritime protective and mitigation measures and public education outreach efforts. Navy's authorizations under the MMPA and ESA include an adaptive management approach that includes continually evaluating existing mitigation measures for their potential impacts on training. If impacts on training from mitigation measures are identified and documented, Navy will raise these impacts with NMFS for resolution during an annual adaptive management review process.
	Mine Warfare (MW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
Range Transients	Anti-Surface Warfare (ASUW)	●	Range transients, involving commercial shipping, commercial fishing, and private pleasure boating encroach on training, either by delaying events or forcing relocation to less than optimum locations. Commercial vessel and recreational vessel encroachment creates avoidance areas and segments training/reduces realism. The Navy will continue to pursue opportunities to inform industry and the public of the impact of range transient encroachment on at-sea OPAREAS and Navy readiness.
	Mine Warfare (MW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
Spectrum	Strike Warfare (STW)	●	Employment of Link 16, SPY-1 radar, SPS 49 radar, and IFF are restricted. Restrictions limit spectrum operations and prohibit certain training events, segment training/reduce realism, reduce training days, limit application of new weapons technologies, and inhibit new tactics development. The Navy continues to coordinate with appropriate frequency allocation and oversight agencies to seek spectrum relief and to develop encroachment strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies. Competition for frequency spectrum will add increased pressure on available bandwidth for Naval operations.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Strike Warfare (STW)	●	Scrub jays, indigo snakes, and gopher tortoises at Pinecastle and Rodman, and manatees at Lake George contribute to training restrictions in their affiliated range and training areas. Species habitat encroachment creates avoidance areas, reduces range access, and inhibits new tactics development. The Navy observes species mitigation measures at Pinecastle, Rodman, and Lake George.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Japan Assessment Details



Japan Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	5.45	5.45	5.45	5.45	5.45	5.68	Encroachment Scores	9.40	8.28	8.28	8.10	8.10	8.10
<p>The capability assessment for this range has been stable from year to year, with relatively constant overall scores for CY2009 through 2013, but has since increased for CY2014 (and beyond) due to a re-evaluation and the addition of the RSC-2. The RSC-2 deployed to Seventh Fleet and can support aerial drone, MK-30 (ASW target), mine shape launch and recovery, deployment and recovery of the portable ASW range, and electronic warfare training (limited). The Navy is evaluating various locations for deployment of the portable ASW range. The Navy, in coordination with U.S. Forces Japan, the Government of Japan, and the Japan Civil Aviation Bureau, have worked out plans for new training airspace to support U.S. Navy aircraft based in Japan, moving from NAF Atsugi to MCAS Iwakuni in the 2017 timeframe. There was an initial DESRON 15 message that was sent to C7F for endorsement via CTF-70, for consideration to move the RSC-2 from Okinawa to Japan. Forward Deployed Naval Forces have expressed concurrence with the idea, as the RSC-2 is currently being underutilized, as it would better facilitate their training, as it would be much closer to their home ports, thus alleviating the requirement to transit down to Okinawa for RSC-2 support services, and better support bi-lateral training. For CY2016, downgraded "Scoring and Feedback System" from a severe to a moderate for AW due to CVW-5 feedback of TCTS impacts. The same applies for STW Threats and Scoring and Feedback.</p>							<p>Encroachment assessments reveal there has been little encroachment change from year to year, with relatively constant overall scores for CY2009 through 2015. There is little indication encroachment pressures will change in the foreseeable future. There are no emerging encroachment issues that affect Japan operations. The CY2017 assessment remains the same as the previous years.</p>						

Japan Detailed Comments

Capability Observations







Attributes	Assigned Training Mission	Score	Comments
Landspace	Strike Warfare (STW)		No Navy controlled range available. This prohibits certain training events, reduces realism, limits application of new technologies, inhibits tactics development, increases personnel optempo, and increases O&M costs. The Navy recommends pursuing opportunities with other services, countries, and in-theater ranges. R130 (inert air-ground range) off Misawa is available, but limited supporting airspace is available for new weapons. USAF created a limited use ALTRV GAICHO, which partially alleviates problem and may allow for JDAM training. Limited training using ALTRV GAICHO is on-going (benefits Growler expeditionary deployments to Misawa). Additional mitigation effects realized by airwing conducting Strike Fighter Advance Readiness Program (SFARP) at FRTC.
	Electronic Combat (EC)		No Navy controlled range available. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits tactics development; increases personnel optempo; and increases O&M costs. The Navy continues to work the RSC-2 & EW capability. Looking to move the RSC-2 to Japan or possibly increase deployments of the RSC-2 to Japan
	Anti-Air Warfare (AAW)		The range has minimal access to overland airspace, which impacts AW training capabilities. This also prohibits certain training events; reduces realism; limits application of new technologies; inhibits tactics development; increases personnel optempo; and increases O&M costs. The Navy will pursue opportunities with other services, countries, and in-theater ranges. No completion date has been identified.
Airspace	Strike Warfare (STW)		There are no Navy controlled ranges available, but there are some airspace and ground targets available. Projected airwing move in 2017 will downgrade training due to limited airspace at the new area. This prohibits certain training events, limits application of new technologies, inhibits new tactics development, increases personnel optempo, and increases O&M costs. The Navy will pursue access to airspace that will support this training. No completion date has been identified.
	Anti-Air Warfare (AAW)		No overland airspace supports AW training at this range. Projected airwing move in 2017 will downgrade training due to limited airspace at the new area. Prohibits certain training events; reduces realism; limits application of new technologies; inhibits tactics development; increases personnel optempo; and increases O&M costs. The Navy continues to work the airspace redesign plan with the GOJ, and continue to pursue opportunities with other services, countries, and in-theater ranges. No completion date has been identified.
	Anti-Submarine (ASW)		Sufficient airspace exists, but there is no associated UTR which inhibits tracking and scoring of torpedo shots. This prohibits certain training events; segments training, and reduces realism. Units currently deploy to the Okinawa portion of the Range Complex to make use of the PUTR when a UTR is required. Continue the development of the RSC-2 with PUTR capability to operate in conjunction with existing airspace. Continue the development of the RSC-2 concept of operations (CONOPS) for a 3rd deployment per year and/or relocate the RSC-2 to the Japan Complex.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Japan Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Seaspace	Mine Warfare (MW)	●	Lack of shallow water training areas and geographic references limit MW training. This prohibits certain training; reduces realism; limits application of new technologies; inhibits tactics development; increases personnel optempo; and increases O&M costs. Recommend evaluating feasibility of creating an OPAREA adjacent to land to support shallow water and geographic reference points. No completion date has been identified.
	Anti-Submarine (ASW)	●	There is no permanent UTR. This prohibits certain training events; segments training; and reduces realism. Units currently deploy to the Okinawa portion of the Range Complex to make use of the PUTR when a UTR is required. The Navy will continue the development of the RSC-2 with PUTR capability to operate in designated range sea space in conjunction with existing airspace. Additionally, it will continue the development of the RSC-2 CONOPS for a 3rd deployment per year and/or relocate the RSC-2 to the Japan Complex.
Underseaspace	Mine Warfare (MW)	●	No dedicated undersea space for Shock Wave Action Generator (SWAG) or mine avoidance training. Sea bottom type does not have required variance; there is insufficient shallow water; and there is no permanent USWTR. This prohibits certain training; reduces realism; limits application of new technologies; inhibits new tactics development; increases personnel optempo; and increases O&M costs. The Navy will evaluate the feasibility of installing a mine training range with instrumented mine shapes, false targets, bottom mines and mines for SWAG training. No completion date has been identified.
	Anti-Submarine (ASW)	●	The OPAREA waters in the Japan portion of the Range Complex do not support training in depths less than 600 feet. Littoral ASW training, with training waters adjacent to land, is not feasible. The lack of a permanent UTR precludes tracking torpedo shots against targets and prevents scoring. This prohibits certain training events; segments training/reduces realism; limits application of new technologies; inhibits tactics development; and increases personnel tempo. Units must travel outside of the Japan portion of the Range Complex to conduct shallow water ASW training. Units currently deploy to the Okinawa portion of the Range Complex to make use of the PUTR when a UTR is required. Often, training occurs during coordinated training events or major exercises. The Navy will evaluate the potential to procure a permanent UTR capability, and will continue the development of the RSC-2 with capability to deploy PUTR. Additionally, the Navy will continue the development of the RSC-2 CONOPS for a 3rd deployment per year and/or relocate the RSC-2 to the Japan Complex.
Targets	Strike Warfare (STW)	●	There are no Navy controlled ranges available. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits tactics development; increases personnel optempo; and increases O&M costs. The Navy will provide air-ground targets and establish supporting SUA. No completion date has been identified.
	Electronic Combat (EC)	●	No targets currently exist, there is limited land area, and the range experiences political and frequency spectrum constraints. USAF added some JDEWR emitters for training at R130 Draughon range in 2013. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits tactics development; increases personnel optempo; and increases O&M costs. The Navy will continue to pursue RSC-2 EW capability and the development of the RSC-2 CONOPS for a 3rd deployment per year and/or relocate the RSC-2 to the Japan Complex.
	Anti-Air Warfare (AAW)	●	The range does not have any supersonic targets or dedicated targets available. This reduces live fire proficiency, increases personnel optempo, and increases O&M costs. The Navy will continue to pursue RSC-2 with target capabilities and continue the development of the RSC-2 CONOPS for a 3rd deployment per year and/or relocate the RSC-2 to the Japan Complex.
	Anti-Surface Warfare (ASUW)	●	The quantity and types of targets are limited at this range. This prohibits certain training events, reduces realism, and reduces live fire proficiency. The Navy will Increase the availability of targets and continue the development of the RSC-2 CONOPS for a 3rd deployment per year and/or relocate the RSC-2 to the Japan Complex.
	Mine Warfare (MW)	●	There are no dedicated or instrumented targets available. Units will typically provide their own targets where feasible. This prohibits certain training events; reduces realism; limits application of new technologies; reduces live fire proficiency; and increases O&M costs. The Navy will evaluate feasibility of installing a mine range with instrumented shapes, false targets, bottom mines, and mines approved for SWAG training. No completion date has been identified.
	Anti-Submarine (ASW)	●	Live and virtual targets are not available at this range. Expendable targets provided by the unit conducting the training are usually used. This reduces realism; limits application of new technologies; inhibits tactics development; reduces live fire proficiency; and increases O&M costs. The Navy recommends establishing an ASW targets unit and continuing the development of the RSC-2 CONOPS for a 3rd deployment per year and/or relocate the RSC-2 to the Japan Complex. No completion date has been identified.

Japan Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Threats	Strike Warfare (STW)	●	There is no dedicated OPFOR at this range, but limited OPFOR is available. This reduces realism, limits application of new technologies, and inhibits tactics development. The Navy recommends improving availability of CAS and EC augmentation. RSC-2 arrived in Okinawa in October 2013, and it provides rudimentary EW training capabilities. The mission area will remain red until an IADS training capability is provided. No completion date identified and no candidate locations are available.
	Electronic Combat (EC)	●	There is no dedicated OPFOR at this range, but limited OPFOR is available. This reduces realism, limits application of new technologies, and inhibits tactics development. The Navy will pursue development of joint EW systems and improve the availability of CAS and EW augmentation, though the RSC-2 currently provides rudimentary EW training capabilities. The Navy will also continue the development of the RSC-2 CONOPS for a 3rd deployment per year and bring the RSC-2 to the Japan Complex. No completion date identified and significant RF limitations/encroachment inhibit live training support.
	Anti-Air Warfare (AAW)	●	There is no dedicated OPFOR at this range, but limited OPFOR is available. This reduces realism, limits application of new technologies, and inhibits tactics development. The Navy will improve availability of CAS and EW augmentation. TCTS will significantly enhance AW training for aviation units, though OPFOR will remain limited.
	Anti-Surface Warfare (ASUW)	●	There is no dedicated OPFOR at this range, but limited OPFOR is available. This reduces realism, limits application of new technologies, and inhibits tactics development. The Navy will improve availability of CAS and EW augmentation, though the RSC-2 currently provides rudimentary EW training capability. The Navy will continue the development of the RSC-2 CONOPS for a 3rd deployment per year and/or relocate the RSC-2 to the Japan Complex.
	Mine Warfare (MW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
Scoring & Feedback	Strike Warfare (STW)	●	No permanent instrumentation currently exists at this range. This reduces realism; limits application of new technologies; inhibits new tactics; and complicates night and all weather training. The Navy will continue planned development of TCTS and evaluate the potential to improve training or cancel the TCTS effort, mitigate it and find an alternative. Currently CVW-5 is assessing a moderate vice severe impact to training from lack of TCTS. Additionally, the Navy will continue to evaluate RSC-2 potential to support training. No scored air to ground ranges for instrumentation have been identified.
	Electronic Combat (EC)	●	No permanent instrumentation currently exists at this range. This reduces realism; limits application of new technologies; inhibits new tactics; and complicates night and all weather training. While RSC-2 provides some training capability, it is not be capable of providing scoring and feedback. The Navy will continue to investigate and evaluate potential for RSC-2 to provide scoring.
	Anti-Air Warfare (AAW)	●	No permanent instrumentation exists on this range. This reduces realism; limits application of new technologies; inhibits new tactics; and complicates night and all weather training. The Navy will continue planned development of TCTS and evaluate the potential to improve training or cancel the TCTS effort, mitigate it and find an alternative. Currently CVW-5 assessing a moderate vice severe impact to training from lack of TCTS. Additionally, the Navy will continue to evaluate RSC-2 potential to support training.
	Anti-Surface Warfare (ASUW)	●	No permanent instrumentation exists at this range. This reduces realism; limits application of new technologies; inhibits new tactics; and complicates night and all weather training. However, RSC-2 has improved support capability. The Navy will continue the development of the RSC-2 CONOPS for a 3rd deployment per year and/or relocate the RSC-2 to the Japan Complex.
	Mine Warfare (MW)	●	No permanent instrumentation exists at this range. This reduces realism; limits application of new technologies; inhibits new tactics; and complicates night and all weather training. The Navy will evaluate the feasibility of installing a mine range with instrumented shapes, false targets, bottom mines and mines approved for SWAG training. It will continue to evaluate RSC-2 potential to support training as well as RSC-2 CONOPS for a 3rd deployment per year and/or relocate the RSC-2 to the Japan Complex.
	Anti-Submarine (ASW)	●	No permanent instrumentation exists at this range, and is not likely to exist in the future. This reduces instrumented range availability. RSC-2 increases availability of PAR/PUTR support. The Navy will continue the development of the RSC-2 CONOPS for a 3rd deployment per year and/or relocate the RSC-2 to the Japan Complex.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

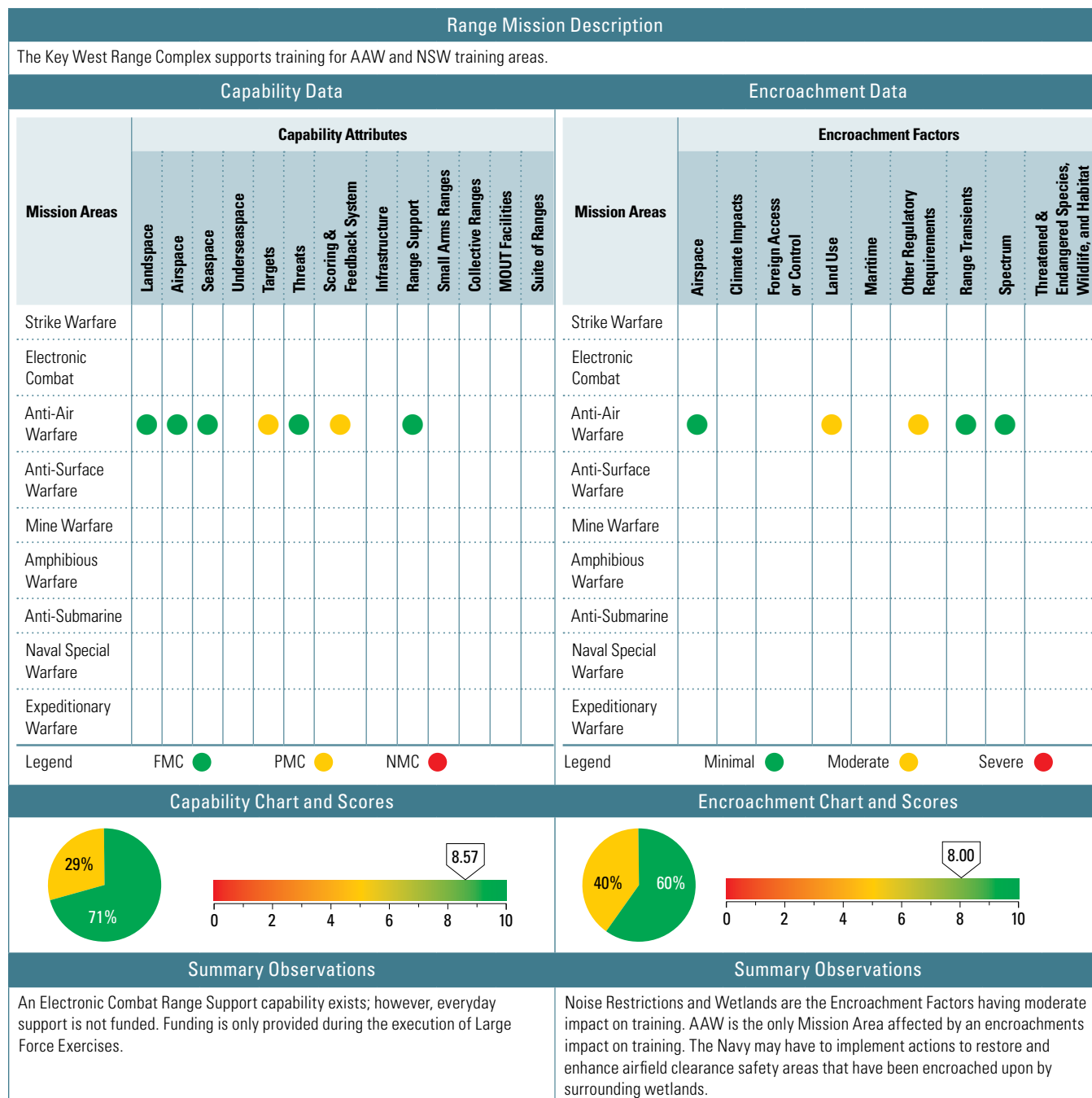
Japan Detailed Comments

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Land Use	Strike Warfare (STW)	●	Unable to conduct night carrier landing practice at home base. Aircraft must travel to remote location for training. Inability to conduct training at home base location reduces air-wing readiness and impacts STW and AW mission. Noise encroachment at Atsugi prohibits certain training events, segments training/reduces realism, reduces training days, limits application of new weapons technologies, and inhibits new tactics development. The CVW-5 move to Iwakuni moves the noise encroachment at Atsugi to Iwakuni (less populated area).
	Anti-Air Warfare (AAW)	●	Same as above.
Maritime	Strike Warfare (STW)	●	Maritime protective and mitigation measures undertaken in compliance with regulatory requirements have resulted in training restrictions that reduce training flexibility, force segmented training, and ultimately reduce training realism. All at-sea training is impacted to some degree; impacts are most significant to integrated warfare training using active underwater acoustic sources or in-water explosive ordnance. The Navy and NMFS have developed science based protective and mitigation measures that adequately protect marine species while accommodating military readiness activities. The Navy continues to develop Environmental Impact Statements and obtain permits and authorizations for its range complexes to ensure military training complies with applicable laws and regulations. Litigation risks remain a concern, entailing the potential to delay or further restrict training, despite the protective and mitigation measures applied by the Navy in compliance with the MMPA and ESA. Endangered species/critical habitat encroachment has created avoidance areas that have resulted in some reduction of training days and the prohibition of certain training events. This area is relatively small in scope; however, if these types of restrictions were applied to other species/areas, there would be significant impacts to readiness through reduction in range access, segmentation of training/reduction in realism, limits on the application of new technologies, raised flight altitudes, reduced live fire proficiency, increased personnel tempo, and increased O&M costs. The Navy continues to invest in marine mammal research; rely on scientifically valid empirical data results as basis of marine mammal mitigation development; and factor mitigation effectiveness into permit requests. Continue education of Fleet units to adhere to the maritime protective and mitigation measures and public education outreach efforts. Navy's authorizations under the MMPA and ESA include an adaptive management approach that includes continually evaluating existing mitigation measures for their potential impacts on training. If impacts on training from mitigation measures are identified and documented, the Navy will raise these impacts with NMFS for resolution during an annual adaptive management review process. The Navy is currently preparing environmental compliance documentation to renew the MMPA and ESA authorizations which will consider any impacts on training stemming from existing mitigations measures and propose changes as warranted.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
Spectrum	Strike Warfare (STW)	●	No EW training ranges due to RF restrictions. RF restrictions limit spectrum operations and prohibit certain training events, segment training/reduce realism, reduce training days, limit application of new weapons technologies, and inhibit new tactics development. The Navy continues to coordinate with GOJ agencies to seek spectrum relief and to develop encroachment strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies. Moderate impact reported by CVW 5.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	No EW training ranges due to RF restrictions. RF restrictions limit spectrum operations and prohibit certain training events, segment training/reduce realism, reduce training days, limit application of new weapons technologies, and inhibit new tactics development. The Navy continues to coordinate with GOJ agencies to seek spectrum relief and to develop encroachment strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies. Moderate impact reported by CVW 5.
	Anti-Surface Warfare (ASUW)	●	All units operating throughout the JORC are precluded from activating SPS-49/SPS-48E radar equipment for test or operational purposes within 12 nm of land areas of Japan or Okinawa. Restrictions limit spectrum operations and prohibit certain training events, segment training/reduce realism, reduce training days, limit application of new weapons technologies, and inhibit new tactics development. The Navy continues to coordinate with GOJ agencies to seek spectrum relief and to develop encroachment strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies.

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Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Key West Assessment Details



Key West Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	7.50	7.50	7.50	7.86	7.86	7.86	Encroachment Scores	9.86	9.55	9.09	8.33	8.33	8.33
<p>The capability attribute most impacting range mission performance is Scoring & Feedback Systems and the mission area most severely impacted is AAW. Score improved in 2017 based on Range Support being scored as fully mission capable with the addition of a web-based scheduling system, DCAST. Assessments of NSW training are based on actual NSW demand and use of training range capability and space (no assessment made for CY2014).</p>							<p>Encroachment assessments for CY2008 were different than for CY2009–2015. The algorithm for the overall assessment score for 2009–2015 was revised from the original algorithm used in 2008 to provide greater fidelity and consistency across all range complexes. Based on an improved review process and revised algorithms, the assessments for CY2009–2015 provide a more accurate assessment of encroachment. The assessments for the latter years reveal there has been little encroachment change from year to year, with relatively constant overall scores through to 2015. The overall encroachment score for CY2017 dropped slightly from 2015 due to changes made in encroachment factors and definitions. The Key West EAP was completed in November 2015. DOI and private energy interests, to include foreign investment and acquisition in the vicinity of the OCS, are increasing as domestic energy demand builds. Naval offshore operating areas and training events may be affected. High priority areas include training ranges and sea space in and adjacent to all Navy OPAREAs. OASN(EI&E) continues to work closely with the Fleets and DOI's BOEM to resolve issues of combined use of the OCS important to both agencies. Fleet review and analysis of impacts from both oil/gas and wind energy lease sale areas have been reviewed and forwarded to OSD. The Western, Central and Eastern GOMEX oil and gas planning areas were reviewed for compatibility in 2016 and 2017. DoD and DOI coordination continues. Emerging encroachment issues that may impact Key West Range Complex training include the establishment of OOS and acoustic sensors/ROVs, and the nomination, approval and/or expansion of NMS, either within or in the vicinity of surface and tactical air training space. Overall 2017 encroachment assessment data remains very similar to 2015.</p>						

Key West Detailed Comments

Capability Observations

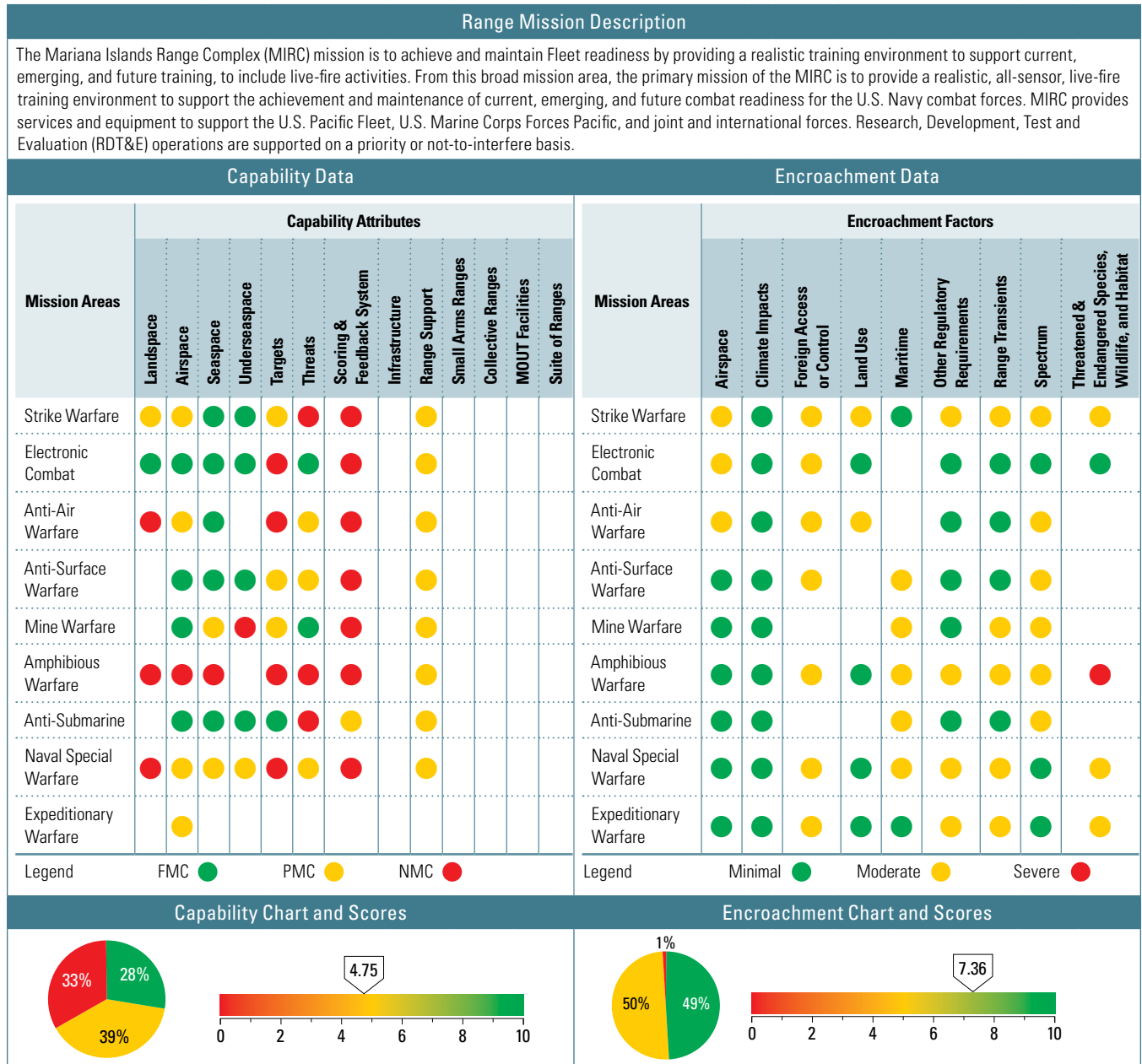
Attributes	Assigned Training Mission	Score	Comments
Targets	Anti-Air Warfare (AAW)	●	Ranges have minimal target support. Air targets are not available unless scheduled in advance (with a long lead time). This increases personnel optempo and increases O&M costs. The Navy recommends providing targets at the range area. No long-term solution date is set. The current workaround solution is that if sufficient lead time is available to schedule targets, and if the required targets are available, targets may be arranged for training.
Scoring & Feedback System	Anti-Air Warfare (AAW)	●	Exercise coordination and control are not available over the entire OPAREA, especially for surface ships. Low altitude tracking and communications are not available through out the entire range due to line of sight issues. Modeling & simulation is not available, though some scoring is available through TCTS. Real Time Kill Notification is available by voice only. This prohibits certain training events; reduces realism; increases personnel optempo; and increases O&M costs.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Land Use	Anti-Air Warfare (AAW)	●	Sonic booms generated by VFA aircraft in the vicinity of the Dry Tortugas reportedly startles visitors and may affect physical deterioration of historic Fort Jefferson. Airspeed limits on Key West Complex participating aircraft prohibit certain training events, segment training, reduce realism, and inhibit new tactics development. The Navy will continue with noise analyses to determine frequency of sonic booms and potential effects on personnel/property, and minimum distance requirements to preclude future noise complaints was completed. The findings of the resulting Environmental Assessment recommended stipulating the expansion of an existing buffer zone around the Dry Tortugas by 2,000 feet, from 18,000 to 20,000 feet, to ensure natural and historic resources would not be impacted.
Other Regulatory Requirements	Anti-Air Warfare (AAW)	●	Wetlands vegetation encroachment obstructs air traffic controllers' lines of site with aircraft and affects radar performance. This air traffic control obstruction could affect access to portions of the Key West range complex airspace. Actions/remedy currently underway to restore and enhance airfield clearance safety areas.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Mariana Islands Assessment Details



Mariana Islands Assessment Details

Summary Observations							Summary Observations						
<p>The Capability Attributes most impacting range mission performance are: Scoring & Feedback Systems, and Targets and Threats. The Mission Areas most severely impacted are: AMW, AAW, and NSW. Delivery of the range support craft in 2013 addresses range support for ASW targets and partial support for other mission areas (ASUW, AAW, EC, and MW). Additionally, delivery of the PUTR in 2014 partially addresses scoring and feedback for ASW. Finally, delivery of improved targets in 2014 on the Farallon de Medinilla (FDM) range partially addresses targets for the STW mission area. Assessments of NSW training are based on actual NSW demand and use of training range capability and space. Actual Training range capability and space requirements are based on Fleet Readiness Training Plan demands for conventional warfare areas.</p>							<p>T&E Species/Critical Habitat, Spectrum, and Maritime Sustainability are the Encroachment Factors with most impact on training. All Mission Areas have encroachment issues that have substantial impact on training. The Navy continues consulting and discussing with MIRC stakeholders on various issues, including encroachment, that pertain to current and future training requirements as they apply to expanded training required primarily of the move of Marine Corps forces to Guam from Okinawa. The Government of Guam also consults with MIRC stakeholders. Additional forces will require supporting training ranges and operating areas on Guam and select islands in the CNMI. Training requirements and training ranges and operating areas are identified and assessed in the Mariana Islands Training and Testing EIS/OEIS (completed in 2015), and the Guam and CNMI Relocation EIS, completed in 2010, and its Roadmap Adjustments SEIS, completed in 2015. A MIRC Airspace EA/OEA has been completed for phase one of a four phase Marianas Airspace Plan. The EA/OEA is under review by the FAA.</p> <p>NOTE on NSW Assessments: assessments of NSW training are based on actual NSW demand and use of training range capability and space. Actual training range capability and space requirements are based on Fleet Readiness Training Plan demands for conventional warfare areas.</p>						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	2.80	2.80	2.80	2.80	3.39	4.58	Encroachment Scores	8.49	7.58	7.54	7.54	7.54	7.54
<p>In the 2010 report the range-specific display incorrectly showed 3.04 as the capability score in the graphic. The actual tabulated score was 2.80. In support of the Marine Corps Guam relocation, the Marine Corps has proposed new small arms, known distance, and maneuver ranges on Guam and Tinian. A .50 caliber machine gun range has been proposed for construction on Guam. Additional training support facilities have been proposed on Guam and Tinian, and additional training on Guam, Tinian, and Pagan. In support of U.S. Air Force training and operational requirements, a new divert airfield has been proposed for aircraft operating from Andersen Air Force Base on Guam. To more safely and securely accommodate Navy and other service training requirements, a four phase air space plan has been proposed that would reconfigure existing SUA and create new Warning Areas and Restricted Areas for conduct of military training, and an expanded Danger Zone around FDM. NEPA for phase one of the plan has been assessed in the 2013 Mariana Islands Range Complex Airspace EA/OEA. FAA review and rulemaking for phase one is pending. A Mariana Islands Test and Training (MITT) EIS/OEIS, completed in 2015, incorporated phase one of the airspace plan into its baseline and preferred alternative, and proposed new and revised small arms firing range Danger Zones for Guam nearshore training areas. In 2014 a multi-purpose range craft was deployed in Seventh Fleet that supports aerial drone, MK-30 (ASW target), and mine shape launch and recovery, deployment/recovery of the portable ASW range, and electronic warfare training (limited). Delivery of a craft to be homeported in Guam occurred in 2013. In 2012 Joint Threat Emitter (JTE) operation was approved on Guam for a site on Northwest Field, Andersen Air Force Base. JTE operation began in 2013. Other potential sites on Guam and CNMI for JTE operation are being reviewed. Also in 2013, new FDM targets were put in place in the inert only impact zone. Munition types in the inert only impact zone have been limited by weight to conserve targets and reduce future UXO clearance requirements. The U.S. Marine Corps Pacific, as Executive Agent for U.S. Pacific Command, is conducting a CNMI Joint Military Training EIS that proposes new U.S. Marine Corps live fire and maneuver training ranges on Tinian and Pagan. Planning for operation of these new proposed ranges alongside the existing Mariana Islands Range Complex is a future consideration. A Guam Relocation Supplemental EIS was completed in 2015 that proposed construction of a Live Fire Training Range Complex for small arms and up to .50 caliber machine gun training on Guam. Planning for operation of these new proposed ranges alongside the existing Mariana Islands Range Complex is a future consideration.</p>							<p>The assessments since CY2010 reveal there has been little encroachment change from year to year, with relatively constant overall scores. The assessment score change from CY2009 to CY2010 is due to a change in EC for airspace of green in CY2009 to yellow in CY2010. The change is attributed to an increased encroachment pressure from commercial aviation regarding the use of chaff and flares in the vicinity of the air routes. Potential growth in military training activity in the Mariana Islands will be subjected to encroachment similar to what is experienced during current training. As training activities spread to the various islands, indigenous encroachment will vary depending on each island's environmental and mitigation protocols. The Mariana Islands Training and Testing EIS/OEIS and the Guam and CNMI Relocation EIS and SEIS are recent and comprehensive NEPA addressing compliance for current and future military training and testing in the Mariana Islands. A Mariana Islands Range Complex air space expansion plan (U.S. Navy, executive agent) was completed in 2013. As a result of this plan, Warning Areas W-11A, W-11B, W-12, W-13A Low, W-13B Low, W-13C Low, W-13A High, W-13B High, and W13C High replaced Air Traffic Control Assigned Airspace (ATCAAs) ATCAA 1, 2, 3A, 3B, 3C, 5, and 6; effective June 22, 2017. The Mariana Islands Training and Testing EIS/OEIS was completed for renewal of the MMPA permit and terrestrial biological evaluations (U.S. Navy, executive agent). Other Department of Defense NEPA are being planned for a divert airfield (U.S. Air Force, executive agent), and for additional land ranges in the Mariana Islands primarily in support of the U.S. Marine Corps (U.S. Marine Corps, executive agent). U.S. Navy, U.S. Air Force, and U.S. Marine Corps are coordinating agencies for future planned NEPA for training and testing activities being proposed for the Mariana Islands. The JRM 2015 Integrated Natural Resources Management Plan (INRMP) for Guam, FDM and Tinian is undergoing review; a signed completed copy is expected November 2017. An EOD emergency open detonation area is needed on Tinian for disposal of UXO, primarily left from WWII actions. CNMI EPA office may require permit for a detonation area. A FDM Operational Range Clearance Plan was completed in 2013. In 2014, operational range clearance was conducted on FDM and old targets were removed and replaced with new targets.</p>						

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Mariana Islands Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Strike Warfare (STW)	●	The fixed amount of land area at this range is too small and options to expand are non-existent. Available target land area detracts from all levels of training. Accordingly, not all training ordnance is cleared for use. The CNMI Joint Military Training (CJMT) EIS considering the Airspace Plan phases three and four, and proposals for additional ranges on other CNMI islands (Pagan and Tinian).
	Anti-Air Warfare (AAW)	●	No suitable land area is available under the training airspace at this range. This prevents realistic overland detection and tracking scenarios. A four phase air space plan has been proposed. NEPA for phase one has been completed with a phased conversion of ATCAAs to Warning Areas, and creation of new overwater and overland SUA. FAA rulemaking for new airspace plan phase one SUA is pending.
	Amphibious Warfare (AMW)	●	There is minimal land area available for AMW training. Live fire is not permitted; maneuver is restricted to use of roads; and helicopters must land on existing airfields or designated landing zones. The range has insufficient land area that supports all logistics over the beach training requirements and this limits realistic training. A four phase air space plan has been proposed. NEPA for phase one has been completed with a phased conversion of ATCAAs to Warning Areas, and creation of new SUA. FAA rulemaking for proposed airspace plan phase one SUA is pending. CJMT EIS may consider airspace plan phases three and four with additional overland airspace for Tinian and Pagan. The Navy will propose a site specific Tinian amphibious landing area in the CJMT EIS or other NEPA.
	Naval Special Warfare (NSW)	●	The range has insufficient maneuver area that supports live fire training; NSW MOUT is too small; and laser designators are not allowed. This limits NSW realistic training. The Navy will assess local areas for a site suited to support required NSW training. No completion date has been identified.
Airspace	Strike Warfare (STW)	●	Size and altitudes of the range airspace are too small, and cannot accommodate multiple strike packages. A four phase air space plan has been proposed. NEPA for phase one has been completed with a phased conversion of ATCAAs to Warning Areas, and creation of new overwater and overland SUA. FAA rulemaking for new airspace plan phase one SUA is pending.
	Anti-Air Warfare (AAW)	●	No suitable land area is available under the training airspace at this range. This prevents realistic overland detection and tracking scenarios. A four phase air space plan has been proposed. NEPA for phase one has been completed with a phased conversion of ATCAAs to Warning Areas, and creation of new overwater and overland SUA. FAA rulemaking for new airspace plan phase one SUA is pending.
	Amphibious Warfare (AMW)	●	Minimal airspace exists over beaches that support AMW and logistics training, and this prevents air support training for AMW and logistics. A four phase air space plan has been proposed. NEPA for phase one has been completed with a phased conversion of ATCAAs to Warning Areas, and creation of new overwater and overland SUA. FAA rulemaking for new airspace plan phase one SUA is pending.
	Naval Special Warfare (NSW)	●	There is no SUA adjacent to land that supports HALO or HAHO parachute training. This prevents complete range of required parachute training. The Navy recommends establishing SUA in required area. No completion date has been identified.
	Expeditionary Warfare (EXW)	●	There is no SUA adjacent to land that supports all parachute training requirements. This prevents complete range of required parachute training. The Navy plans to establish SUA in required area, but no completion date has been identified.
Seaspace	Mine Warfare (MW)	●	No designated operating area for nearshore mine laying exists at this range. This prevents training to proper procedures for mining. The Navy plans to designate a geographic reference point and operating area for nearshore mining; however no completion date has been identified.
	Amphibious Warfare (AMW)	●	A site specific designated sea space supported by required beach front is not available at this range. This prevents conduct of AMW beach assault training and beach logistics training. The Navy proposes a site specific Tinian amphibious landing area in the CJMT EIS or other NEPA.
	Naval Special Warfare (NSW)	●	There is insufficient beachfront contiguous with sea area, and coral heads prevent access to beaches from sea, thus limiting NSW training. The Navy will assess local area for a site suited to support required training. No completion date has been identified.
Underseaspace	Mine Warfare (MW)	●	There is no dedicated area for mine avoidance training at this range. The extreme water depth and lack of variance in sea bottom is problematic. This limits mine countermeasures training. The Navy plans to assess the feasibility of installing a mine training range with instrumented shapes, false targets, and mines for SWAG training. No completion date has been identified.
	Naval Special Warfare (NSW)	●	There is insufficient beachfront contiguous with sea area, and coral heads prevent access to beaches from sea. This limits NSW training on the range. The Navy plans to assess local area audited to support required training. No completion date has been identified.

Mariana Islands Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Targets	Strike Warfare (STW)	●	There are no raked, structural, revetted, or moving targets at the range; targets do not support cluster munitions; targets do not support multiple strike packages; and targets do not have spectral signatures. This limits live fire and realistic training. A four phase air space plan has been proposed. NEPA for phase one has been completed with a phased conversion of ATCAAs to Warning Areas, and creation of new overwater and overland SUA. FAA rulemaking for new airspace plan phase one SUA is pending.
	Electronic Combat (EC)	●	There are several land and mobile EW sites and emitters (e.g. HARM emitter) although none are available for live targeting. The full range of EC training that requires target support is not available, and there are no EW emitters on FDM supporting the live, inert, and NSFS target positions. Additionally, the number, locations, and type of emitters available in MIRC are not adequate to represent a complex targeting environment. The Navy plans to assess the feasibility of establishing target unit at the range complex.
	Anti-Air Warfare (AAW)	●	MIRC has no locally available AAW target systems; however regional air target services and contract opposing air services are sometimes available and may be requested. As a result, the full range of AAW training that requires target support is not available. The Navy plans to assess feasibility of establishing target unit at the range complex.
	Anti-Surface Warfare (ASUW)	●	There is limited surface target support available for training at MIRC, therefore the full range of ASUW training that requires target support is not available. The Navy plans to assess feasibility of supporting additional targets at the range complex.
	Mine Warfare (MW)	●	No targets available from range; users sometimes supply their own targets. May degrade future training capability requirements (e.g. Littoral Combat Ship) for organic mine countermeasures systems (OMCM) units deployed regionally. Assess feasibility of installing a mine range with instrumented mines, false targets, and mines for Shock Wave Action Generator training.
	Amphibious Warfare (AMW)	●	No targets exist for AMW FIREX training at this range, and there are no co-located live fire areas and amphibious landing areas. This prevents live fire training associated with AMW training. The Navy plans to integrate Navy AMW target requirements into Marine Corps amphibious feasibility study. No completion date has been identified.
	Naval Special Warfare (NSW)	●	No targets exist for NSW training. MOUT facility is limited. This reduces live fire proficiency and inhibits new tactics. The Navy will assess the feasibility of establishing a targets division at range complex. No completion date has been identified.
Threats	Strike Warfare (STW)	●	No OPFOR or EW threat stimulation is available at the range for STW. Full range of STW training that requires OPFOR support is not available. The Navy will assess the feasibility of establishing OPFOR resources at the range complex. No completion date has been identified.
	Anti-Air Warfare (AAW)	●	EW threat stimulation (JTE) is available on Guam at the Milky Way Site. Full range of EW training that requires OPFOR support is not available. Contract air support services are available regionally (with DRFM) but must have sufficient priority to provide support and is not available locally for routine training. The Navy will study the feasibility of establishing additional OPFOR resources at the range complex. No completion date has been identified.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Mariana Islands Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Scoring & Feedback	Strike Warfare (STW)	●	No instrumentation exists at the range. Full range of training that requires instrumentation is not available. The Navy will assess the feasibility of providing instrumentation to the range complex. No completion date has been identified.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Assess the feasibility of providing a permanent range to support ASW. The PUTR has been deployed to Guam since 2014. Range support craft that will support PUTR, MK-30, and EXTORP was delivered in 2013.
	Naval Special Warfare (NSW)	●	Same as Strike Warfare (STW).
Range Support	Strike Warfare (STW)	●	MIRC is an uncontrolled range where range users are responsible for clearing ranges and safe conduct of all activity. Recommend establishing a FACSAC on Guam with communications, networking, and radar coverage for the Marianas operating areas. Recommend establishing a radio over internet protocol communications system between the Andersen Air Force Base Wing Operations Center with aircraft utilizing airspace surrounding FDM to support reliable communications with distant aircraft, and to also support a means for communicating with future scoring and feedback systems to be established on FDM. UAS operations are limited by airspace restrictions, and track integration with fleet training events. Recommend coordination with the FAA to identify UAS requirements over the entire MIRC to facilitate safe, tactically significant UAS operations.
	Electronic Combat (EC)	●	PACFLT's DCAST includes a post-event module to mitigate issues outlined above. DCAST has been deployed and further development is in progress. MIRC is an uncontrolled range where range users are responsible for clearing ranges and safe conduct of all activity. Recommend establishing a FACSAC on Guam with communications, networking, and radar coverage for the Marianas operating areas. UAS operations are limited by airspace restrictions, and track integration with fleet training events. Recommend coordination with the FAA to identify UAS requirements over the entire MIRC to facilitate safe, tactically significant UAS operations.
	Anti-Air Warfare (AAW)	●	MIRC is an uncontrolled range complex in which range users are solely responsible for clearing ranges and for the safe conduct of all activity. MIRC Operations are not resourced to execute a control function. Range Users are not able to immediately communicate to MIRC Operations potential "fouled" ranges or encroachment by commercial/private vessels and emergencies during training execution. Recommend establishing a radio over internet protocol communications system between the Andersen Air Force Base Wing Operations Center and FDM to support reliable communications with distant aircraft. This system also serves as a communications backbone with which future scoring and feedback systems can be established on FDM. Further recommend resourcing MIRC Operations with a control function capability that includes personnel, communications, networking, and radar coverage that spans the complex.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
	Naval Special Warfare (NSW)	●	UAS operations are limited by airspace restrictions and track integration with fleet training events. Limited training time for UAS operators to sustain proficiency. Recommend coordinating with the FAA to identify UAS requirements over the entire MIRC to facilitate safe, tactically significant UAS operations.

Mariana Islands Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Strike Warfare (STW)	●	Marianas airspace is adequate when the ATCAAs are available; however, scheduling can be problematic as FAA is not always flexible to short notice requests. FAA in Marianas has tremendous pressure from the airlines. Warfare areas participating in combined arms training are impacted by the current lack of SUA over land areas in the Marianas. Encroachment from airspace restrictions creates avoidance areas, prohibits certain training events, reduces range access, segments training/reduces realism, and inhibits new tactics development. The Navy completed a MIRC Airspace EA/OEA proposing the establishment of Warning Areas to replace the ATCAAs and additional Restricted Airspace surrounding FDM. Warning Areas (to replace ATCAAs) were implemented on June 22, 2017. Potential range complex upgrades with live-fire ranges proposed by the Marine Corp (CNMI Joint Military Training EIS), requirement for additional SUA and SDZ application to the US Army Corp of Engineers to extend existing Restricted Airspace (R-7201A) over the live-fire range (FDM) is pending.
	Electronic Combat (EC)	●	FAA restrictions on EC/chaff operations in proximity to air routes is problematic. EC/chaff restrictions creates avoidance areas, prohibits certain training events, segments training/reduces realism, inhibits new tactics development, and limits application of new technologies. The MIRC Airspace EA/OEA proposed Warning Areas includes EC/chaff operations. Warning Areas were implemented on June 22, 2017.
	Anti-Air Warfare (AAW)	●	Marianas airspace is adequate when the ATCAAs are available; however, scheduling can be problematic as FAA is not always flexible to short notice requests. FAA in Marianas has tremendous pressure from the airlines. Warfare areas participating in combined arms training are impacted by the current lack of SUA over land areas in the Marianas. Encroachment from airspace restrictions creates avoidance areas, prohibits certain training events, reduces range access, segments training/reduces realism, inhibits new tactics development. The Navy completed a MIRC Airspace EA/OEA proposing the establishment of Warning Areas to replace the ATCAAs and additional Restricted Airspace surrounding FDM. Warning Areas (to replace ATCAAs) were implemented on June 22, 2017. Potential range complex upgrades with live-fire ranges proposed by the Marine Corp (CNMI Joint Military Training EIS), requirement for additional SUA and SDZ application to the US Army Corp of Engineers to extend existing Restricted Airspace (R-7201A) over the live-fire range (FDM) is pending.
Foreign Access or Control	Strike Warfare (STW)	●	Navy is concerned with foreign intelligence collection opportunities resulting from a persistent foreign presence proximate to Navy operations, testing, and training equities ashore and at-sea. As previously stated in the 2025 Air Test and Training Range Enhancement Plan, "An emerging challenge is the increasing presence of foreign business interests in the vicinity of our sensitive test and training ranges." Foreign acquisition of real estate in close proximity to Mariana Islands Range Complex, a critical training and testing range, offers the ability to maintain a permanent presence near areas vital to Navy missions and national security, and facilitate an opportunity to collect critical information regarding national defense programs. Additionally, foreign investment to acquire U.S. businesses that operate near Navy activities is another avenue for establishing a permanent presence that presents very unique mission compatibility challenges. Navy actively engages in CFIUS, Fleet Commanders, Navy Region Commanders, and community planner to evaluate the security risks of foreign investment acquisitions in proximity to DoD equities. Although Navy considers this to be a potential encroachment threat for all testing and training ranges, the Navy's CFIUS Office (Proximity), in close coordination with the mission owners, has tracked and monitored foreign investment activities near the Mariana Island Range Complex and many other key ranges.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Mariana Islands Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Land Use	Strike Warfare (STW)	●	<p>Base and range complex aviation activities occur in Federal Aviation Administration authorized airspace and in international airspace. The impact of aviation activities occurring into and out of Andersen Air Force Base (AAFB) are analyzed as part of the Air Installation Compatible Use Zone (AICUZ) Program. There is privately owned land near the runway at Andersen Air Field Northwest that falls within the clear zones for aircraft operations. Nighttime flying activities are restricted and flight tracks are routed to avoid populated areas. Only mission essential aircraft arrivals and departures are scheduled between 2200 and 0600 hours. Private owners file noise complaints. The nighttime restrictions impact scheduling and the conduct of night time training activities for aircraft operating from AAFB. Joint Region Marianas and the Air Force continue close coordination with local stakeholders to ensure military operations can proceed normally. AAFB AICUZ Noise Study was completed in August 2016; Public Outreach meeting occurred August 22-23, 2016.</p> <p>There is a continuing concern with noise at Andersen (in proximity to Northwest Field) due to residential areas adjoining the property. Nighttime flying activities are restricted and flight tracks are routed to avoid populated areas. Only mission essential aircraft arrivals and departures are scheduled between 2200 and 0600 hours. MITT BO includes flight altitude restrictions on Guam and Tinian because of ESA listed species. Noise related restrictions prohibit certain training events; complicate night training. The Air Force continues close coordination with local stakeholders to ensure military operations can proceed normally. AAFB AICUZ Noise Study was completed in August 2016; Public Outreach meeting occurred August 22-23, 2016.</p>
	Anti-Air Warfare (AAW)	●	Same as above.
Maritime	Anti-Surface Warfare (ASUW)	●	<p>Maritime protective and mitigation measures undertaken in compliance with regulatory requirements have resulted in training restrictions that reduce training flexibility, force segmented training, and ultimately reduce training realism. All at-sea training is impacted to some degree; impacts are most significant to integrated warfare training using active underwater acoustic sources or in-water explosive ordnance. The Navy and NMFS have developed science based protective and mitigation measures that adequately protect marine species while accommodating military readiness activities. The Navy continues to develop Environmental Impact Statements and obtain permits and authorizations for its range complexes to ensure military training complies with applicable laws and regulations. Litigation risks remain a concern, entailing the potential to delay or further restrict training, despite the protective and mitigation measures applied by the Navy in compliance with the MMPA and ESA. Endangered species/critical habitat encroachment has created avoidance areas that have resulted in some reduction of training days and prohibits certain training events. This area is relatively small in scope; however, if these types of restrictions were applied to other species/areas, there would be significant impacts to readiness through reduction in range access, segmentation of training/reduction in realism, limits on the application of new technologies, raised flight altitudes, reduced live fire proficiency, increased personnel tempo, and increased O&M costs. The Navy will continue to invest in marine mammal research; rely on scientifically valid empirical data results as basis of marine mammal mitigation development; factor mitigation effectiveness into permit requests; and educate Fleet units to adhere to the maritime protective and mitigation measures and public education outreach efforts. Navy's authorizations under the MMPA and ESA include an adaptive management approach that includes continually evaluating existing mitigation measures for their potential impacts on training. If impacts on training from mitigation measures are identified and documented, Navy will raise these impacts with NMFS for resolution during an annual adaptive management review process. Region INRMP updates and National Security Exclusion letters/memorandums may address/preclude potential limitations for usage/need to consult under ESA on effects to habitat (coral critical habitat).</p>
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.

Mariana Islands Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Other Regulatory Requirements	Strike Warfare (STW)	●	De-vegetation, wildland fires and erosion on FDM caused by explosive munitions has restricted and prohibited certain munitions expenditures. MITT BO also restricts the types of munitions allowed. FDM restrictions create avoidance areas, prohibit certain training events. FDM users are continually reminded to use only authorized munitions and to keep munitions on island. All Military Services are subject to and conform to training restrictions.
	Amphibious Warfare (AMW)	●	LCAC landing is not allowed at Chulu Beach, Tinian. Only CRRCs and RHIBs may land at various points along the shorelines. The pervasiveness of cultural resources in the Marianas limits locations for large logistics training exercises. Landing zones are constrained from extending further inland by cultural resource areas. LCAC training restrictions create avoidance areas and prohibit certain training events. Site specific analysis for amphibious landings on Tinian may be analyzed in the CJMT EIS. The Guam Legislature approved the creation of a system of five marine preserves through Public Law 24-21. These preserves were implemented in 2001. They are: Tumon Bay Marine Preserve, Piti Bomb Holes Marine Preserve, Sasa Bay Marine Preserve, Achang Reef Flat Marine Preserve, and Pati Point Marine Preserve. They were created to protect and preserve near shore coral reef fisheries and wetlands. Reserve Craft Beach (RCB) at NBG supports amphibious warfare training, and it is within the Sasa Bay Marine Preserve. On Tinian, the MITT BO restricts training in or around wetlands and establishes aircraft altitude restrictions to avoid disturbance to nesting endangered birds. The Guam Legislature did not exempt the Navy in its law establishing marine preserves; however the Navy does not recognize Guam regulatory oversight over the Federally owned and Navy managed underwater and nearshore lands, which includes RCB. Other Federal laws and Federal agencies regulatory agreements that are in effect protect the sensitive habitat and protected species (corals, turtles, etc.) in these areas. The Navy identifies and assesses these areas in its 2015 Mariana Islands Training and Testing EIS/OEIS and identifies the training that it may conduct at RCB, which includes amphibious warfare training with some self-restrictions (e.g. no discharging into Sasa Bay or using explosive ordnance in Sasa Bay). The presence of wetlands near the waterfront creates avoidance areas or requires a Section 404 permit under the Clean Water Act for dredge or fill activities.
	Naval Special Warfare (NSW)	●	Same as above. OB/OD permitting in the Naval Munitions Annex restricts training activity. Restrictions prohibit certain training events. The Navy is evaluating alternatives that will allow appropriate training venues in conjunction with Marine Corps planning for new ranges and training areas on Guam and in the Northern Mariana Islands.
	Expeditionary Warfare (EXW)	●	Same as above.
Range Transients	Strike Warfare (STW)	●	Commercial and private fishing, diving, recreation boats and beach recreation activity frequent near-shore areas throughout the Marianas. Transient boat traffic interrupts or stops military training activity. Increased commercial and recreational use may prohibit or restrict training and require additional security patrols Training interruptions reduce range access, create avoidance areas, segment or result in lost training, reduce realism, and prohibit certain training events. The Navy pursues outreach, through the Regional Encroachment Working Group to local mayors, fishermen, and tour operators to ensure better understanding of military training. The Navy is pursuing the establishment of a danger zone around FDM for safety reasons.
	Mine Warfare (MW)	●	Commercial and private fishing, diving, recreation boats and beach recreation activity frequent near-shore areas throughout the Marianas. Transient boat traffic interrupts or stops military training activity. Transient boat activity reduces range access, creates avoidance areas, segments or results in lost training, reduces realism, and prohibits certain training events. Active patrolling of near-shore areas may need to be implemented to avoid civilian encroachment onto hot ranges and training areas. The Navy pursues outreach through the Regional Encroachment Working Group to local mayors, fishermen, and tour operators to ensure better understanding of military training.
	Amphibious Warfare (AMW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

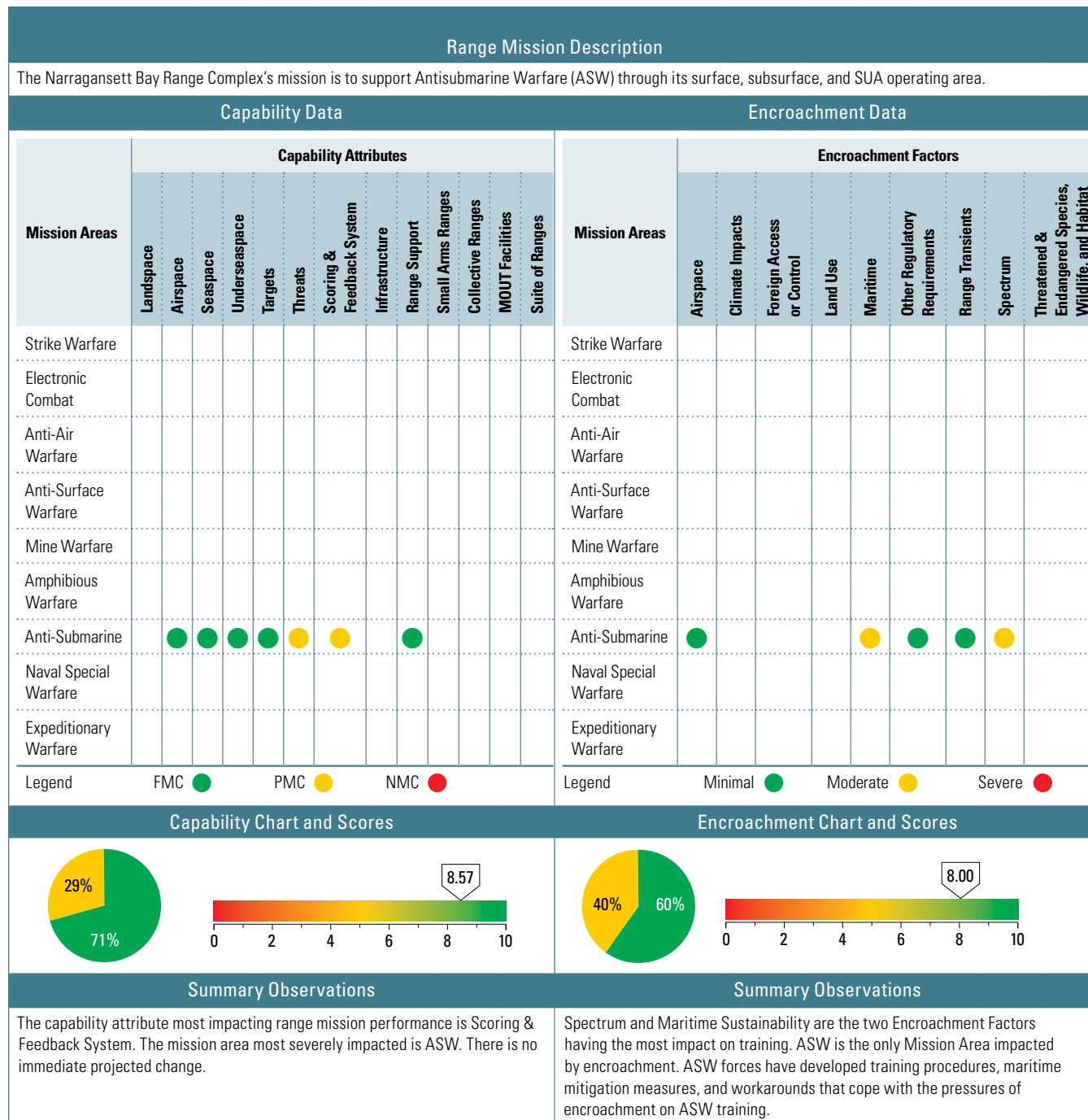
Mariana Islands Detailed Comments

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Spectrum	Strike Warfare (STW)	●	Employment of Link 16 is restricted. Restrictions limit spectrum operations and prohibit certain training events, segment training/reduce realism, reduce training days, limit application of new weapons technologies, and inhibit new tactics development. The Navy continues to coordinate with appropriate frequency allocation and oversight agencies to seek spectrum relief and to develop encroachment strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies. Competition for frequency spectrum will add increased pressure on available bandwidth for Naval operations.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Employment of Link 16, SPY-1 radar, SPS 49 radar, and IFF are restricted. Restrictions limit spectrum operations and prohibit certain training events, segment training/reduce realism, reduce training days, limit application of new weapons technologies, and inhibit new tactics development. The Navy continues to coordinate with appropriate frequency allocation and oversight agencies to seek spectrum relief and to develop encroachment strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies. Competition for frequency spectrum will add increased pressure on available bandwidth for Naval operations.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Strike Warfare (STW)	●	Threatened species and migratory bird habitat restricts the area available for training on FDM. Restrictions create avoidance areas, prohibit certain training events, reduce range access, segment training/reduce realism, complicate night and all-weather training, and raise flight altitudes. The Navy complies with current regulations, attempts to negotiate a reduction in the number of restrictions throughout the complex, and designate alternate locations for STW that do not have such restrictions.
	Amphibious Warfare (AMW)	●	MMPA, ESA (e.g. brown tree snake (BTS) inspections and biosecurity protocols), and the EIS for Military Training in the Marianas, place restrictions on military training throughout the Marianas. Biological Opinion Conservation Measures place restrictions on military operations. Coral and essential fish habitat (EFH) conservation, marine mammal protection, turtle nesting, and BTS inspections and biosecurity protocols are some of the encroachment issues that influence training activities. LCAC and Amphibious Assault Vehicle (AAV) landings on the beaches in the Marianas are limited to only Reserve Craft Beach on Guam and prohibited on Tinian per the MITT BO. Amphibious landings will require compensatory coral reef mitigation efforts. Species restrictions create avoidance areas, prohibit certain training events, reduce range access, segment training/reduce realism, complicate night and all-weather training, and raise flight altitudes. All Military Services are subject to and must conform to training restrictions (i.e. brown tree snake inspections and biosecurity protocols, turtle nest avoidance, avoidance of protected species habitat areas).
	Naval Special Warfare (NSW)	●	MMPA, ESA (e.g. the USDA BTS protocol), and the EIS for Military Training in the Marianas, place restrictions on military training throughout the Marianas. Regulatory controls have resulted in INRMPs that place restrictions on military training. Restrictions create avoidance areas, prohibit certain training events, reduce range access, and segment training/reduce realism. The Navy continues to pursue regulatory relief while adhering to compliance provisions.
	Expeditionary Warfare (EXW)	●	Same as above.

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Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Narragansett Bay Assessment Details



Narragansett Bay Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	7.14	7.86	7.86	7.86	7.86	7.86	Encroachment Scores	8.75	8.00	8.00	8.00	8.00	8.00
ASW Scoring & Feedback was Red in CY2008 and re-evaluated to Yellow in CY2009. Scoring had remained consistent since 2009, but has improved in 2017 due to Range Support being graded as fully mission capable based on the use of a new web-based scheduling tool, DCAST. No future changes are anticipated.							Encroachment assessments for CY2008 were different than for CY2009–2015. The algorithm for the overall assessment score for 2009–2015 was revised from the original algorithm used in 2008 to provide greater fidelity and consistency across all range complexes. Based on an improved review process and revised algorithms, the assessments for CY2009–2015 provide a more accurate assessment of encroachment. The assessments for the latter years reveal there has been little encroachment change from year to year, with relatively constant overall scores through to 2015. The Northeast, Virginia Capes, and Chesapeake Bay Offshore Encroachment Action Plan, including the Narragansett Bay Range Complex, was completed November 2015. DOI and private energy interests in the OCS are increasing as domestic energy demand builds. Naval offshore operating areas and training events may be affected. High priority areas include training ranges and sea space in and adjacent to all Navy OPAREAs. OASN(EI&E) continues to work closely with the Fleets and DOI's BOEM to resolve issues of combined use of the OCS important to both agencies. Fleet review and analysis of impacts from both oil/gas and wind energy "lease sale" areas have been reviewed and forwarded to OSD. DoD and DOI coordination continues. Massachusetts, Rhode Island and New York state and Federal officials have designated offshore wind areas for lease to developers of commercial scale offshore wind farms. Wind turbines are currently operational southeast of Block Island, RI. Future wind farms may have the potential to affect military operations in the Narragansett Range Complex; however, good coordination among Federal and state task force representatives and DoD and Navy planners has and should continue to limit impacts to maritime training. Emerging encroachment issues that may impact the Narragansett Range Complex training include establishment of OOS, nomination and approval of NMS, either within or in the vicinity of surface and submarine training space and transit lanes (ex. Hudson Canyon), and power and telecommunications undersea cable distribution near sensitive training space.						

Narragansett Bay Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Threats	Anti-Submarine (ASW)	●	There are limited dedicated live submarines, surface ships, or aircraft to serve in the OPFOR role. This shortfall prohibits certain training events; reduces realism; inhibits tactics; increases personnel optempo; and increases O&M costs. The Navy will invest in additional threat OPFOR and increase availability of submarines through the Diesel Electric Submarine Initiative (DESI) and aircraft through the Contract Air Support programs. No completion date has been identified.
Scoring & Feedback Systems	Anti-Submarine (ASW)	●	There is no underwater tracking range, scoring capability, M&S, or post mission feedback available at this range. This prohibits certain training events; reduces realism; limits weapon technologies; inhibits tactics; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy plans to expand and improve 2-D and 3-D coverage of the OPAREA; invest in JNTC compliant M&S; and improve debrief capabilities.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Narragansett Bay Detailed Comments

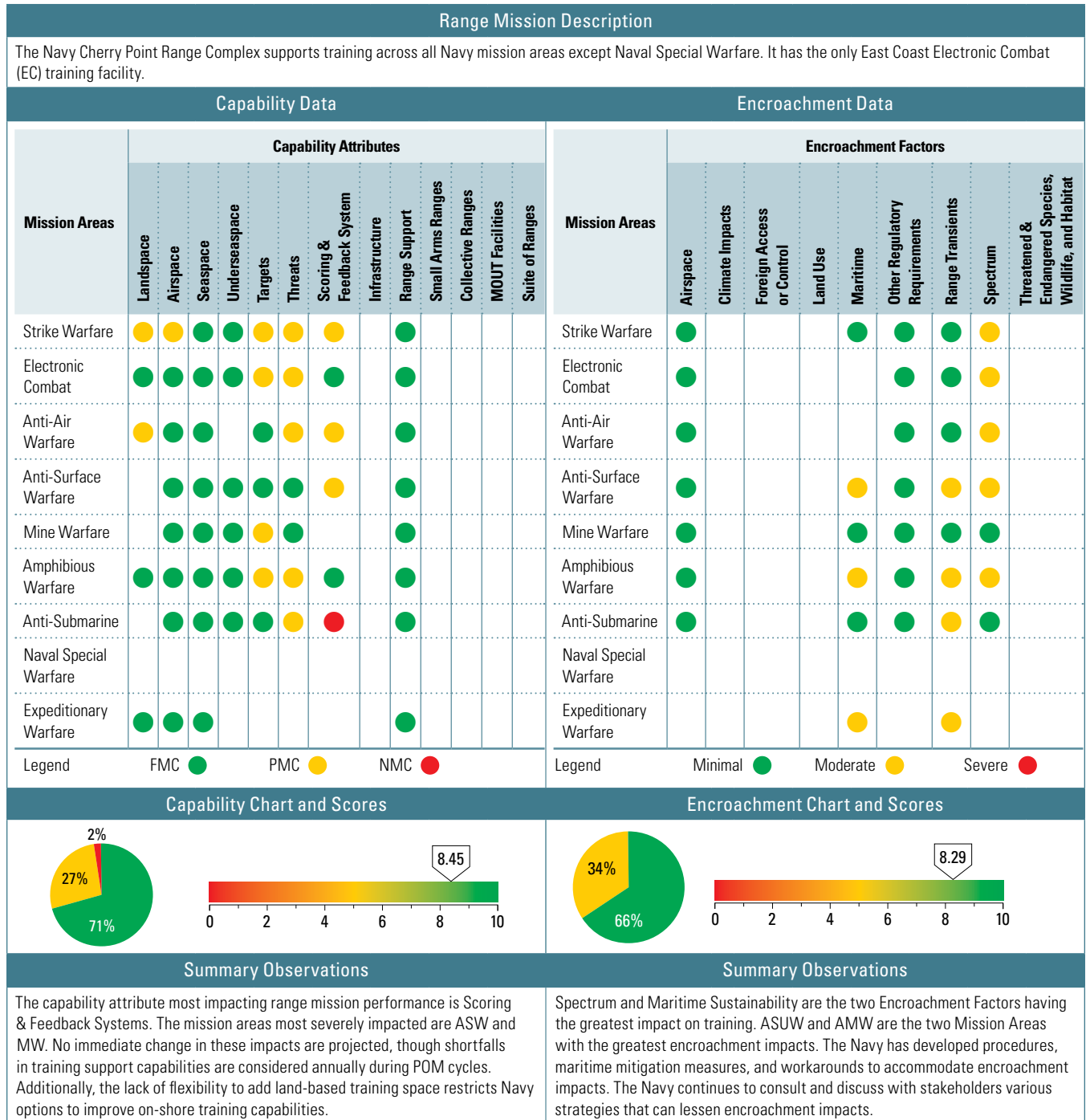
Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Maritime	Anti-Submarine (ASW)	●	Maritime protective and mitigation measures undertaken in compliance with regulatory requirements have resulted in training restrictions that reduce training flexibility and ultimately reduce training realism. All at-sea training is impacted to some degree; impacts are most significant to integrated warfare training using active underwater acoustic sources. The Navy and NMFS have developed science based protective and mitigation measures that adequately protect marine species while accommodating military readiness activities. The Navy continues to develop Environmental Impact Statements and obtain permits and authorizations for its range complexes to ensure military training complies with applicable laws and regulations. Litigation risks remain a concern, entailing the potential to delay or further restrict training, despite the protective and mitigation measures applied by the Navy in compliance with the MMPA and ESA. Endangered species/critical habitat encroachment from the North Atlantic right whale has created avoidance areas that have resulted in some reduction of training days and prohibits certain training events. This area is relatively small in scope; however, if these types of restrictions were applied to other species/areas, there would be significant impacts to readiness through reduction in range access, segmentation of training/reduction in realism, limits on the application of new technologies, raised flight altitudes, reduced live fire proficiency, increased personnel tempo, and increased O&M costs. The Navy will continue to invest in marine mammal research; rely on scientifically valid empirical data results as basis of marine mammal mitigation development; factor mitigation effectiveness into permit requests; and continue education of Fleet units to adhere to the maritime protective and mitigation measures and public education outreach efforts. Navy's authorizations under the MMPA and ESA include an adaptive management approach that includes continually evaluating existing mitigation measures for their potential impacts on training. If impacts on training from mitigation measures are identified and documented, Navy will raise these impacts with NMFS for resolution during an annual adaptive management review process.
Spectrum	Anti-Submarine (ASW)	●	Employment of Link 16, SPY-1 radar, and IFF are restricted. Restrictions limit spectrum operations and prohibit certain training events, segment training/reduce realism, reduce training days, limit application of new weapons technologies, and inhibit new tactics development. The Navy continues to coordinate with appropriate frequency allocation and oversight agencies to seek spectrum relief and to develop encroachment strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies. Competition for frequency spectrum will add increased pressure on available bandwidth for Naval operations.

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Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Navy Cherry Point Assessment Details



Navy Cherry Point Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	7.40	7.50	7.50	7.65	7.65	8.29	Encroachment Scores	8.29	8.33	8.33	8.47	8.47	8.29
<p>The airspace training requirement for STW was re-evaluated between the 2008 report and 2009. The revised impact assessment from Red to Yellow was based on review of similar impacts at Jacksonville and VACAPES range complexes in order to achieve a consistent evaluation between ranges. MW Scoring & Feedback changed from Red to White based on USFF evaluation that TSPI Scoring data is not required. The range's overall score increased in 2017 due to Range Support changing from yellow to green following the use of a new web-based scheduling tool, DCAST.</p>							<p>Encroachment assessments for CY2008 were different than for CY2009–2015. The algorithm for the overall assessment score for 2009–2015 was revised from the original algorithm used in 2008 to provide greater fidelity and consistency across all range complexes. Based on an improved review process and revised algorithms, the assessments for CY2009–2017 provide a more accurate assessment of encroachment. The overall encroachment score for CY2017 dropped slightly from 2015 due to changes made in encroachment factors and definitions. The Cherry Point OPAREA EAP was completed in March 2013. DOI and private energy interests, to include foreign investment and acquisition in the vicinity of the OCS, are increasing as domestic energy demand builds. Naval offshore operating areas and training events may be affected. High priority areas include training ranges and sea space in and adjacent to all Navy OPAREAs. OASN(EI&E) continues to work closely with the Fleet and DOI's BOEM to resolve issues of combined use of the OCS important to both agencies. Fleet review and analysis of impacts from both oil/gas and wind energy "lease sale" areas have been reviewed and forwarded to OSD. DoD and DOI coordination continues. North Carolina and South Carolina state and federal officials designated offshore wind areas for lease to developers of commercial scale offshore wind farms. Future wind farms may have the potential to affect military operations in the Cherry Point Range Complex; however, good coordination among Federal and state task force representatives and DoD and Navy planners has limited any impact to maritime training. Recent federal executive action has removed a moratorium on Atlantic oil/gas development; this issue should remain in the Navy's purview as the potential exists that it, along with other areas within the Cherry Point Complex, may be considered for exploration and development. Mission Critical Areas have been identified and continued coordination with OSD and BOEM should help to mitigate impacts to Navy training and certification. Emerging encroachment issues that may impact Cherry Point Range Complex training include establishment of OOS, nomination, expansion, and approval of NMS and/or monuments, either within or in the vicinity of surface and submarine training space and transit lanes (ex. Monitor NMS), power and telecommunications undersea cable distribution near sensitive training space, and commercial shipping anchorage area and sea lane expansion.</p>						

Navy Cherry Point Detailed Comments

Capability Observations




Attributes	Assigned Training Mission	Score	Comments
Landspace	Strike Warfare (STW)		There is no land in the Navy Cherry Point range. Land area in contiguous Marine Corps ranges provides some landspace and contains two targets, but the land size does not meet minimum requirements.
	Anti-Air Warfare (AAW)		Landspace is only available at adjacent Marine Corps ranges and at the Dare County Bombing Range (NDCBR), which does not fully support size or topography requirements, or support surface combatant detection of aircraft over land. Additionally, the use of flares in training is restricted. This prohibits certain training events, reduces realism, and increases personnel optempo. Overland ACM training is conducted at FRTC.
Airspace	Strike Warfare (STW)		There is no landspace available on the Navy Cherry Point range. Land area in contiguous Marine Corps ranges provide some landspace, but the airspace configuration lacks characteristics for realistic tactical approaches and does not support the area size needed to meet minimum training requirements. Altitudes are limited to 17,999 feet and the area is not cleared for supersonic operations. This reduces realism, inhibits new tactics development, and reduces live fire proficiency.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Navy Cherry Point Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Targets	Strike Warfare (STW)	●	No targets for strike warfare training are available in the range. Two targets are moderately supported by contiguous USMC ranges, but do not allow live ordnance. This reduces realism, prohibits certain events, increases personnel optempo, and increases O&M costs. Improvements are expected due to recent investment planning for targets, but additional investment in moving and urban targets located in a land area that will support STW is required.
	Electronic Combat (EC)	●	There is no EC support above level 2 for aircraft and no support for surface units. Contiguous USMC ranges provide some support, but lack mobile targets, and lack sufficient threat emitters to cover range of threats. This prohibits certain training events, and reduces realism. The Navy is investing in upgrades to MAEWR to cover selected range threat investments.
	Mine Warfare (MW)	●	There are insufficient training mines to support increased MW training requirements from MH-60 and MH-53 helicopter squadrons. This prohibits certain training events, reduces realism, inhibits tactics, increases personnel optempo, and increases O&M costs. The Navy will procure appropriate mix of recoverable and expendable inert bottom and moored mine shapes to meet readiness training requirements.
	Amphibious Warfare (AMW)	●	Portable beach obstacles are available, but are not cleared for engagement/destruction. This reduces realism for assault training and prohibits certain training events, such as obstacle clearance.
Threats	Strike Warfare (STW)	●	An additional amount of live or virtual fixed winged or helicopter OPFOR is required for realistic threat representation. The lack of these capabilities limits realism and prohibits certain events.
	Electronic Combat (EC)	●	EC threat representation does not fully support EC threat levels 3 or 4 for required mission areas. Additionally, existing instrumentation systems are becoming obsolete and unsupportable through the FYDP. No instrumentation systems provide LVC capability. Although TCTS Increment II is the identified solution, the projected number of pods is well short of the requirement. This reduces realism, inhibits tactics development, and greatly increases O&M costs.
	Anti-Air Warfare (AAW)	●	Helicopter and supersonic threat OPFOR and required quantity of threat OPFOR is not available. This shortfall reduces realism, inhibits new tactics development, increases personnel optempo, and increases O&M costs.
	Amphibious Warfare (AMW)	●	There is no dedicated OPFOR consisting of minefields, submarines, small high-speed boats, a battalion sized ground force, a company-sized mechanized force, and anti-ship cruise missiles available. This reduces realism and inhibits new tactics development.
	Anti-Submarine (ASW)	●	There are limited dedicated live submarines, surface ships, or aircraft to serve in the OPFOR role. This prohibits certain training events, reduces realism, inhibits tactics, increases personnel optempo, and increases O&M costs.
Scoring & Feedback System	Strike Warfare (STW)	●	The OPAREA lacks full TSPI and EC&C coverage due to line of sight issues with the Fleet operating over the horizon. Additionally, there are no M&S capabilities and the range lacks real-time kill notification. This reduces realism, prohibits certain events, increases personnel optempo, and increases O&M costs.
	Anti-Air Warfare (AAW)	●	OPAREA coverage is not complete, M&S is inadequate, and there is no RTKN at this range. This reduces realism, inhibits tactics, increases personnel optempo, and increases O&M costs.
	Anti-Surface Warfare (ASUW)	●	The range lacks full TSPI coverage, there are no M&S capabilities, and it lacks automatic scoring. This reduces realism, inhibits tactics, increases personnel optempo, and increases O&M costs.
	Anti-Submarine (ASW)	●	There is no underwater tracking range, scoring capability, M&S, or post mission feedback at this range. This prohibits certain training events, reduces realism, limits weapon technologies, inhibits tactics, reduces live fire proficiency, increases personnel optempo, and increases O&M costs. The Navy plans to develop and fund east coast USWTR, expand and improve 2-D and 3-D coverage of the OPAREA, invest in JNTC compliant M&S, and improve debrief capabilities. The East Coast USWTR is planned for FOC in FY2023.

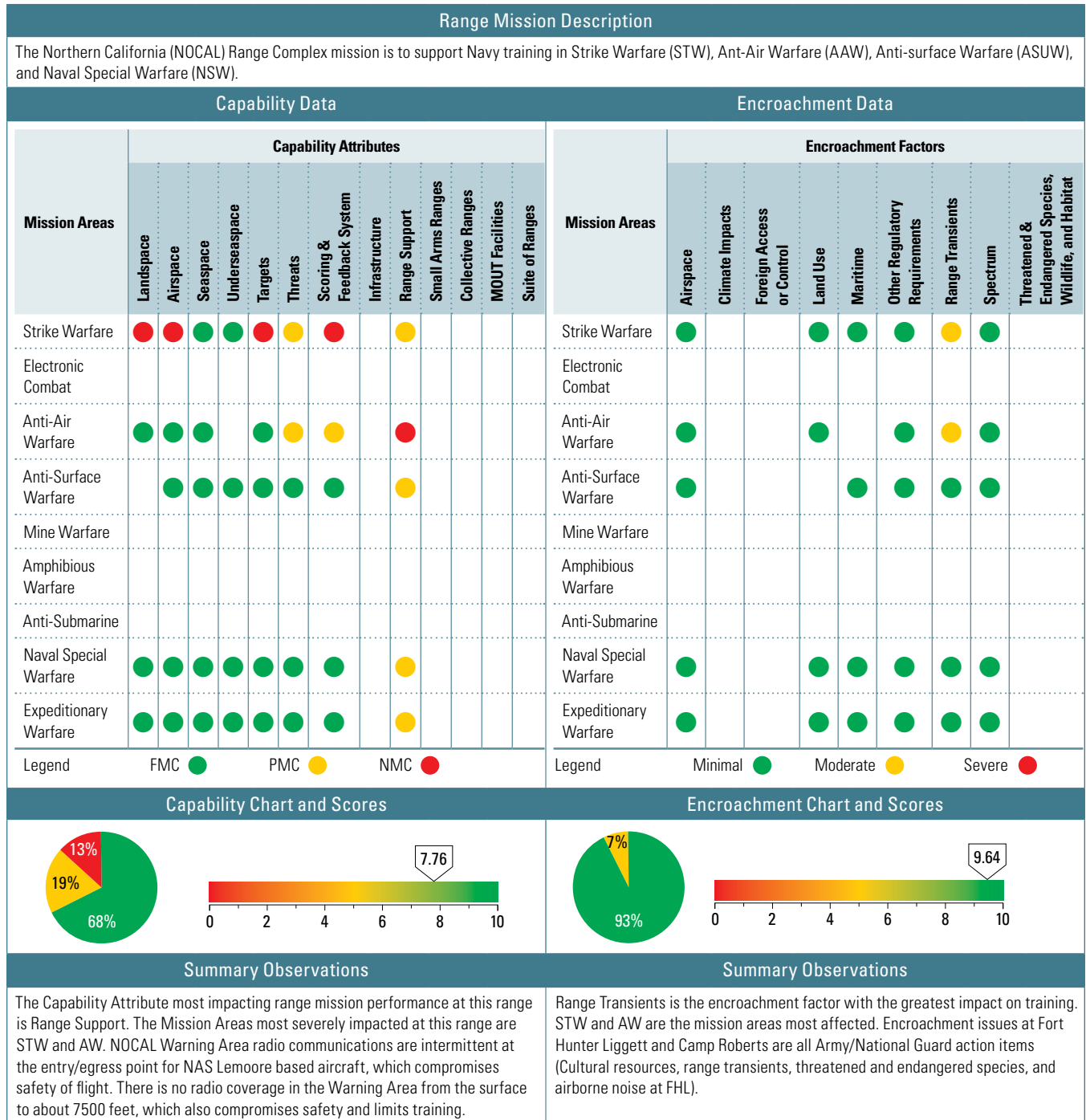
Navy Cherry Point Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Maritime	Anti-Surface Warfare (ASUW)	●	Maritime protective and mitigation measures undertaken in compliance with regulatory requirements have resulted in training restrictions that reduce training flexibility and ultimately reduce training realism. All at-sea training is impacted to some degree; impacts are most significant to integrated warfare training using active underwater acoustic sources. The Navy and NMFS have developed science based protective and mitigation measures that adequately protect marine species while accommodating military readiness activities. The Navy continues to develop Environmental Impact Statements and obtain permits and authorizations for its range complexes to ensure military training complies with applicable laws and regulations. Litigation risks remain a concern, entailing the potential to delay or further restrict training, despite the protective and mitigation measures applied by the Navy in compliance with the MMPA and the ESA. Endangered species/critical habitat encroachment from the North Atlantic right whale has created avoidance areas that have resulted in some reduction of training days and prohibits certain training events. This area is relatively small in scope; however, if these types of restrictions were applied to other species/areas, there would be significant impacts to readiness through reduction in range access, segmentation of training/reduction in realism, limits on the application of new technologies, raised flight altitudes, reduced live fire proficiency, increased personnel tempo, and increased O&M costs. The Navy will continue to invest in marine mammal research; rely on scientifically valid empirical data results as basis of marine mammal mitigation development; factor mitigation effectiveness into permit requests; and continue education of Fleet units to adhere to the maritime protective and mitigation measures and public education outreach efforts. Navy's authorizations under the MMPA and ESA include an adaptive management approach that includes continually evaluating existing mitigation measures for their potential impacts on training. If impacts on training from mitigation measures are identified and documented, Navy will raise these impacts with NMFS for resolution during an annual adaptive management review process.
	Amphibious Warfare (AMW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.
Range Transients	Anti-Surface Warfare (ASUW)	●	Range transients, involving commercial shipping, commercial fishing, and private pleasure boating encroach on training, either by delaying events or forcing relocation to less than optimum locations. Commercial vessel and recreational vessel encroachment creates avoidance areas and segments training/reduces realism. The Navy will continue to pursue opportunities to inform industry and the public of the impact of range transient encroachment on At Sea OPAREAS and Navy readiness.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.
Spectrum	Strike Warfare (STW)	●	FACSFAC and FAA communications and flight procedures in controlled airspace between W-122 and R-5306A/ C/D/E (the Navy Cherry Point Range Complex to BT-9, BT-11 and G-10 impact areas) interrupt the flow of tactical flight operations from W-122 to the R-5306 airspace. Airspace restrictions encroachment segments training and reduces realism. FACSFAC VACAPES, Marine Corps Air Station Cherry Point (MCAS CP), Marine Corps Base Camp Lejeune (MCB CL) continue to coordinate with each other and the FAA Washington Center to refine airspace procedures and alleviate airspace flight restrictions that provide better tactical aircraft movement from W-122 to the R-5306.
	Electronic Combat (EC)	●	Employment of Link 16, SPY-1 radar, SPS 49 radar, and IFF are restricted. Restrictions limit spectrum operations and prohibit certain training events, segment training/reduce realism, reduce training days, limit application of new weapons technologies, and inhibit new tactics development. The Navy continues to coordinate with appropriate frequency allocation and oversight agencies to seek spectrum relief and to develop encroachment strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies. Competition for frequency spectrum will add increased pressure on available bandwidth for Naval operations.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Northern California (NOCAL) Assessment Details



Northern California (NOCAL) Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	6.67	6.75	6.75	6.92	7.33	7.43	Encroachment Scores	9.58	9.58	9.58	9.58	9.58	9.68
The capability assessment has been stable from year to year, with relatively constant overall scores. Capability increases for 2011 forward are primarily a reflection of the establishment of the Naval Expeditionary Warfare Command and the designation of Expeditionary Warfare (EXW) as a primary warfare area. EXW and NSW training in NOCAL is increasing. The expansion of TCTS to cover Warning Area events will require more robust communications capabilities to support safety and training requirements.							The algorithm for the overall assessment score for 2009–2011 was revised from the original algorithm used in 2008 to provide greater fidelity and consistency across all range complexes. Based on an improved review process and revised algorithms, the assessments for subsequent calendar years provide a more accurate assessment of encroachment. The assessments for the latter three years reveal there has been little encroachment change from year to year, with relatively constant overall scores. There is little indication encroachment pressures will change in the foreseeable future, although the inclusion of the Superior Valley/R-2508 could change the assessment.						

Northern California (NOCAL) Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Strike Warfare (STW)	●	There is no Navy owned landspace in the training range complex. Army Fort Hunter Liggett provides support for limited helicopter training, but their support for FRS and Fleet F/A-18 squadron strike training capability is severely limited. These units must therefore rely on out-of-area training to fulfill basic level requirements. This prohibits training events; complicates night and all-weather training; reduces realism; limits tactics; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends the development of an instrumented air-to-ground range in the NOCAL Training Range Complex, as well as investigating other feasible range areas. No completion date has been identified.
Airspace	Strike Warfare (STW)	●	There is no Navy owned landspace in the training range complex. Army Fort Hunter Liggett provides support for limited helicopter training, but their support for FRS and Fleet F/A-18 squadron strike training capability is severely limited. These units must therefore rely on out-of-area training to fulfill basic level requirements. This prohibits training events; complicates night and all-weather training; reduces realism; limits tactics; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends the development of an instrumented air-to-ground range in the NOCAL Training Range Complex, as well as investigating other feasible range areas. No completion date has been identified.
Targets	Strike Warfare (STW)	●	Only one target site exists at this range, and there are no designated mean points of impact (DMPs) or raked targets. This prohibits certain training; reduces realism; limits application of new technologies; inhibits some tactics; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends investigating other feasible range areas to support this training. No completion date has been identified.
Threats	Strike Warfare (STW)	●	There is no live helicopter threat capability; the quantity and variety of threat does not meet requirements; and EW threat above level 2 is not available at this range. These shortfalls reduce realism; inhibit new tactics development; limit application of new weapons technologies; and reduces live fire proficiency. The Navy recommends investing in fully mobile threat systems; simulators with TSPI integration; upgraded Integrated Air defense System; and EW threat systems through level 4. No completion date has been identified.
	Anti-Air Warfare (AAW)	●	Same as above.
Scoring & Feedback System	Strike Warfare (STW)	●	Link-16 and the introduction of TCTS at NAS Lemoore provide a basic-level of TSPI coverage of NOCAL MOAs, with some debriefing and mission reconstruction capability. There is currently no M&S capability and only a limited scoring system at this range. The maturing of TCTS will provide the needed upgrade. Additionally, there is an unmet requirement for a Range Training Officer/Range Safety Officer (RTO/RSO) capability. RTO/RSO capability would improve overall training and would enable training operators to evaluate training evolutions in real-time and provide a safety aspect. NAS Lemoore is one of the only installations without RTO/RSO capability. Funding would need to include both installation facilities and range infrastructure. The current debriefing system has a lag time of about 1 ½ hours. These shortfalls increase O&M costs, personnel optempo; reduce realism, and inhibit tactics. The Navy recommends investment in JNTC compliant M&S and expansion of TCTS coverage into the Warning Areas, and link with other feasible range areas. Additionally, the Navy recommends investment in RTO/RSO capabilities at NAS Lemoore. No completion date has been identified.
	Anti-Air Warfare (AAW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Northern California (NOCAL) Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Range Support	Strike Warfare (STW)	●	There is an unmet requirement for a RTO/RSO capability at this range. RTO/RSO capability would improve overall training and would enable training operators to evaluate training evolutions in real-time and provide a safety aspect. NAS Lemoore is one of the only installations without RTO/RSO capability. Funding would need to include both installation facilities and range infrastructure. Additionally, the current debriefing system has a lag time of about 1 ½ hours. The lack of RTO/RSO capability decreases safety and training realism because training operators cannot confirm kill shots or remove training participants from the training exercise. The Navy recommends investment in RTO/RSO capabilities at NAS Lemoore. The set up would need to be similar to NAS Fallon or NAS Key West to include radios, tracking/controlling and record/playback capability for real time safety and debrief. No completion date has been identified.
	Anti-Air Warfare (AAW)	●	FACSFAC San Diego has only a single radio, located at Half Moon Bay, dedicated to safety of flight/exercise communications in W-283. It is located 110 NM from the entry/egress point, resulting in intermittent communications due to distance. Additionally, there is no radio coverage in the Warning Area from the surface to approximately 7,500 feet MSL. Training events are projected to dramatically increase in the Warning Area once the TCTS installation is complete, thus enhancing the importance of upgraded communications systems. Intermittent communications compromises safety of flight; limits training; limits exercise control; and prohibits adequate event debrief and reconstruction. The Navy recommends investments in upgraded communications equipment to sufficiently cover radio communication to the entirety of the Warning Areas. No completion date has been identified.
	Anti-Surface Warfare (ASUW)	●	FACSFAC San Diego has only a single radio, located at Half Moon Bay, dedicated to exercise communications in W-283. Because of location, there is no radio coverage in the Warning Area from the surface to approximately 7,500 feet MSL. Intermittent communications compromises safety and limits integrated surface warfare training. The Navy recommends investments in upgraded communications equipment to sufficiently cover radio communication to the entirety of the Warning Areas. No completion date has been identified.
	Naval Special Warfare (NSW)	●	Training areas lack a RTO/RSO capability. Additionally, NSW and EXW training at CR/FHL is scheduled using the Army's RFMSS system, which does not provide accurate data collection of Navy readiness information. The lack of RTO/RSO decreases safety and training realism, and inaccurate readiness data reduces efficiency in exercise planning. The Navy recommends investment of RTO/RSO capabilities at CR/FHL, as well as investment in Navy-specific readiness data collection system at CR/FHL, or integration of current data collection system with RFMSS.
	Expeditionary Warfare (EXW)	●	Same as above.

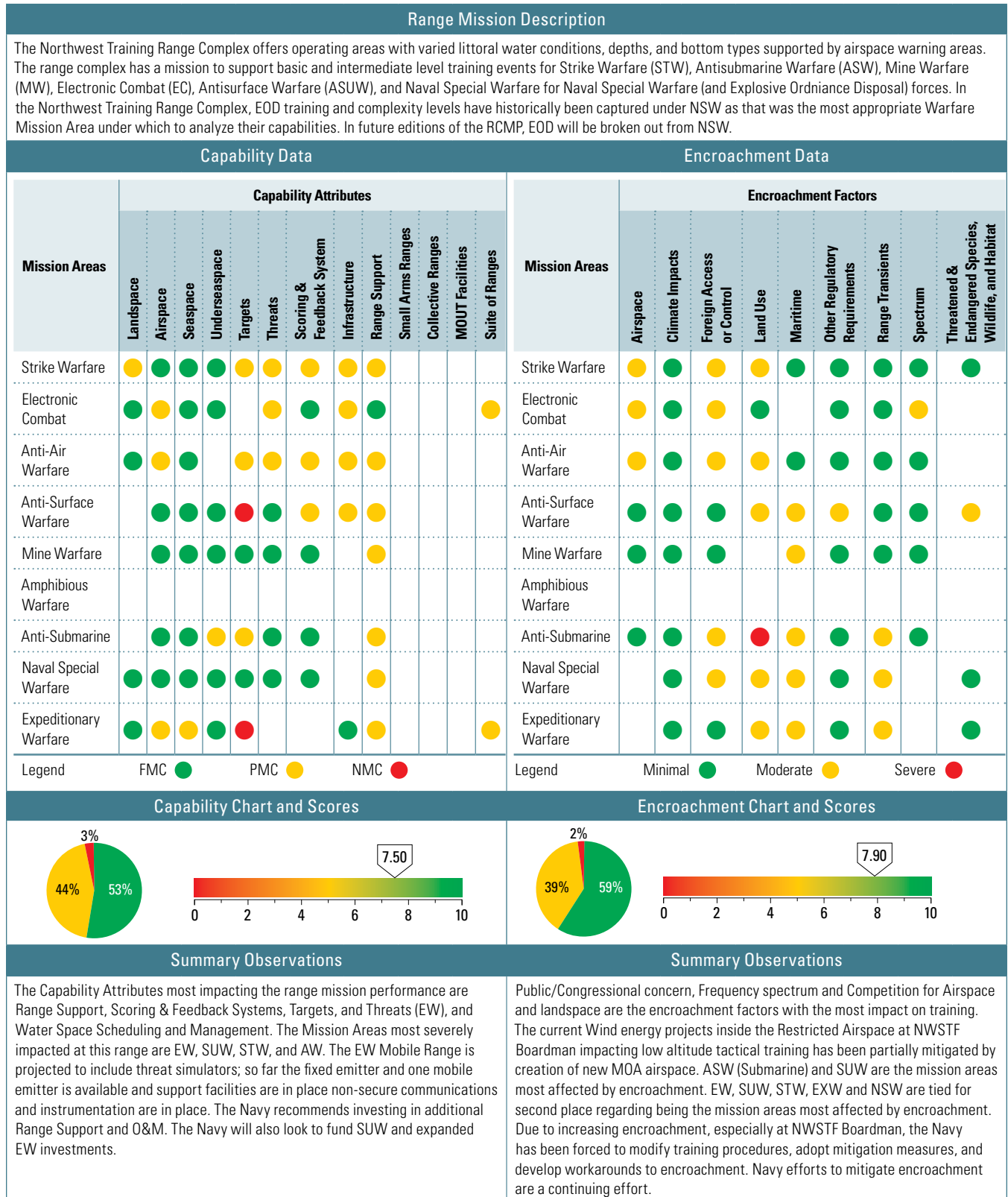
Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Range Transients	Strike Warfare (STW)	●	Civil aircraft fly through the Hunter, Roberts, and Foothills MOAs when the MOAs are activated. Military aircrews must be vigilant to see and avoid small civil aircraft. This encroachment requires aircrews to direct their attention away from the mission at-hand to avoid collisions or near misses with civil aircraft. It also prohibits certain training events, segments training, reduces realism, and inhibits new tactics development. The Navy and the Army may seek to enlarge the MOAs and create transit corridors, for civil aircraft, that are below the training altitudes for military aircraft.
	Anti-Air Warfare (AAW)	●	Same as above.

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Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Northwest Training Range Complex Assessment Details



Northwest Training Range Complex Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	7.98	7.88	7.88	7.79	7.69	7.31	Encroachment Scores	9.40	9.04	9.04	8.58	8.08	8.08
EW threats for 2017 were re-evaluated to Yellow with Fixed and Mobile EW equipment on station, along with the required signal variations that will meet FRS training requirements in place; however still awaiting final resolution from USFS for road permits for the Mobile Emitter and delivery of two more mobile emitters. Due to the lack of SUW and EXW (NSFS) targets, range systems, and range support, the NWTRC had no other emerging capability issues during 2017 that affected NWTRC operations. For the 2017 assessment, EW systems and facility capability remains as Moderate due to the lack of road permits for the Mobile Emitters. This includes the categories of "Threats, Scoring & Feedback, and Range Support" because the support systems are on station. FOC is estimated in the 2nd quarter of FY2018. The Navy is currently waiting on final USFS decision.							The assessments for the latter few years reveal there has been little encroachment change from year to year, with relatively constant overall scores for CY2010 and on. NWSTF Boardman continues to deal with loss of low altitude training capability below 1,000 feet above ground level due to vertical encroachment from various wind energy projects that place wind turbines in and around the Boardman SUA and MTRs. The wind turbines range from 450-495 feet in height. FAA directives require a 500 feet vertical and lateral clearance criteria in the vicinity of each wind turbine for aircraft activity Navy aircraft have to start maneuvers about a mile away to meet these avoidance requirements. Combined with the approximate 450 feet height of a wind turbine, the 500 feet clearance criteria mandates that low altitude flying in the vicinity of a wind turbine must remain at roughly 1,000 feet or greater above ground level. Boardman Low MOA and extension of Boardman MOA have relieved some of the concern however more land use agreement work is needed. A dairy farm established in the NWSTF Boardman Arlington MTR is the cause of the loss of approximately 1 mile of run-in arming area for aircraft into the main target area. Noise restrictions for SUW have been downgraded from a "moderate" impact to a "minimal" impact due to the Northwest Training and Testing EIS ensuring coverage for noise from shooting blanks inside the Crescent Harbor Naval Operations Area.						

Northwest Training Range Complex Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Strike Warfare (STW)	●	NWSTF Boardman's size does not meet requirements per the RCD. Live ordnance is not allowed; though the use of inert ordnance at Basic and Sustainment level is authorized. This inhibits tactics development; limits application of new weapon technologies; increases personnel optempo; and increases O&M costs. The Navy is reviewing options for redeveloping the bombing range area and establishing range control. The Boardman EIS was completed in December 2015.
Airspace	Electronic Combat (EC)	●	While the Darrington OPAREA EW operating altitude limits are not clearly specified, they can be expected from 10,000 feet (3,048 m) MSL to FL230. Flare expenditure is allowed overland but only in designated SUA. Increased airspace is most likely necessary to accommodate the additional student throughput for 2020-2025, and its additional EW and Air Warfare Integration training requirements. Existing SUA is becoming overcrowded, and flight delays are occurring while awaiting clearance to enter MOAs. These delays are causing a loss of training time and occasionally the cancellation of training events. A review of the possible increase in area and vertical limit of SUA is ongoing. NASWI is currently pursuing control of the Olympic MOAs and W-237 in support of aircraft transfer of control from the NAS into the SUA. Navy ATC control of the Olympic MOAs and W-237 is anticipated to reduce delay times into the SUA.
	Anti-Air Warfare (AAW)	●	If continued rural development and alternative energy wind generators are not curtailed in NWSTF Boardman airspace, Low Altitude Tactical Training (LATT) will be impacted more in the future; and has the potential to create a severe impact. This development segments training, prohibits certain training events, reduces realism, and inhibits new tactics development. The Navy has applied for and attained additional airspace to support training needs, expanding the Boardman MOA, and is also exploring options for expanding/modifying additional MOAs (Olympic MOA and Darrington Operating Area). The Navy will continue to support encroachment initiatives for pursuing land easements and purchases in the vicinity of NWSTF Boardman.
	Expeditionary Warfare (EXW)	●	NWSTF Boardman airspace only goes to 20,000 feet. EOD MU-11 has a requirement to conduct HALO/HAHO, resulting in a need surface to 25,000 feet. These Airspace limitations impact training and readiness. Team member qualification is typically performed in San Diego, but have the ability to maintain qualification capability in the Pacific Northwest. The Navy recommends obtaining an Altitude Reservation from 20,000 feet to 25,000 feet from FAA in order to support this training.
Seaspace	Expeditionary Warfare (EXW)	●	The lack of an at-sea, crew-served weapons range affects realism and weapons proficiency. This inhibits tactics development; reduces live-fire proficiency; segments training/testing; and reduces realism. The Navy has recommended a review of inshore water areas for an appropriate site to conduct crew served weapons training.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Northwest Training Range Complex Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Underseaspace	Anti-Submarine (ASW)	●	There has been a loss of undersea space due to existing hydrophone arrays within the northern and mid sections of the PACNORWEST OPAREA, which are causing undersea space to be unavailable for training. This inhibits tactics development; limits application of new weapon technologies; increases personnel optempo; and increases O&M costs. As a result, training is conducted in Nanoose and in the SOCAL OPAREAs, and all submarine training is now conducted in SOCAL.
	Strike Warfare (STW)	●	NWSTF Boardman is cleared for inert ordnance only and supports only transient aircraft training. Additionally, the range is not Laser certified. This prohibits certain training events, reduces realism, limits application of new technologies, inhibits new tactics development, reduces live fire proficiency, increases personnel tempo, and increases O&M costs. The Navy completed the Boardman EIS in December 2016, and the range is in the process of attaining a Laser Certification to support laser targeting systems.
	Anti-Air Warfare (AAW)	●	There are no OPFOR assets in the range complex. This reduces live AWI proficiency; limits application of new weapon technologies; increases personnel optempo; and increases O&M costs. The Navy is reviewing an investment strategy and requirements to support additional range support services. In the meantime, training is attained using COMVAQWING assets or during an occasion where an aggressor squadron will be available.
	Anti-Surface Warfare (ASUW)	●	There are no towed, remote, or stationary targets available for SUW, NSFS, and small arms. These limitations reduce realism; inhibit tactics; limit the application of new weapon technologies; reduce live fire proficiency; increase personnel optempo; and increase O&M costs. The Navy is reviewing an investment strategy and requirements to support self propelled, towed, programmed, or remote controlled targets. In the meantime, ships are completing qualifications on other ranges, and small boat teams are completing qualifications on other land ranges.
	Anti-Submarine (ASW)	●	NWTRC does not currently supply any targets. Instead, units provide target support. The Navy recommend ROS support for targets.
	Expeditionary Warfare (EXW)	●	There is currently no target support for DDGs for NSFS. This reduces realism; inhibits tactics; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. As a result of these limitations, local DDGs attain this training in SOCAL.
Targets	Strike Warfare (STW)	●	The full required EW threat level does not exist at NWSTF Boardman. Additionally, there is no live or virtual rotary or fixed wing threat which exists at the range. Two re-locatable EW threat simulators have been on station since 2012; however, there is no O&M programed to support. The Navy is pursuing a review of the EW threat need on NWSTF Boardman land area; which has been reported as too small for EA-18G EW training needs. Other Navy transient aircraft rarely use the facility.
	Electronic Combat (EC)	●	Realistic OPFOR variety and responses are not available; and while EC threats are available on the Olympic Peninsula, the range still cannot support FRS full syllabus due to lack of use of USFS roads. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel OPTempo; and increases O&M costs. The Navy is engaged with the USFS in getting the road permits to support enhanced EW threat capabilities. The estimated initial operational date of EW range is May 2017 and FOC is the 2nd quarter of 2018.
	Anti-Air Warfare (AAW)	●	There are no OPFOR assets currently in the range complex. This reduces live AWI proficiency; limits application of new weapon technologies; increases personnel optempo; and increases O&M costs. The Navy is reviewing an investment strategy and requirements to support additional range support services. In the meantime, training is attained using COMVAQWING assets or during an occasion where an aggressor squadron will be available.
Threats	Strike Warfare (STW)	●	The range currently lacks instrumentation and there is no real-time or debrief capability. This increases personnel optempo; reduces realism; increases O&M costs; and inhibits tactics development. The Navy is reviewing an investment strategy and requirements to support instrumentation investment that will meet requirements for an instrumented range. No completion date has been identified.
	Anti-Air Warfare (AAW)	●	The range lacks ground instrumentation for supporting airborne simulation in aircraft and there is no real-time or debrief capability. This increases personnel optempo; reduces realism; increases O&M costs; and inhibits tactics development. The Navy is reviewing an investment strategy and requirements to support instrumentation investment that will meet the requirements for an instrumented range. No completion date has been identified.
	Anti-Air Warfare (AAW)	●	The range lacks ground instrumentation for supporting surface simulation to ships and there is no real-time or debrief capability. This increases personnel optempo; reduces realism; increases O&M costs; and inhibits tactics development. The Navy is reviewing an investment strategy and requirements to support instrumentation investment that will meet the requirements for an instrumented range. No completion date has been identified.
Scoring & Feedback System	Strike Warfare (STW)	●	The range currently lacks instrumentation and there is no real-time or debrief capability. This increases personnel optempo; reduces realism; increases O&M costs; and inhibits tactics development. The Navy is reviewing an investment strategy and requirements to support instrumentation investment that will meet requirements for an instrumented range. No completion date has been identified.
	Anti-Air Warfare (AAW)	●	The range lacks ground instrumentation for supporting airborne simulation in aircraft and there is no real-time or debrief capability. This increases personnel optempo; reduces realism; increases O&M costs; and inhibits tactics development. The Navy is reviewing an investment strategy and requirements to support instrumentation investment that will meet the requirements for an instrumented range. No completion date has been identified.
	Anti-Air Warfare (AAW)	●	The range lacks ground instrumentation for supporting surface simulation to ships and there is no real-time or debrief capability. This increases personnel optempo; reduces realism; increases O&M costs; and inhibits tactics development. The Navy is reviewing an investment strategy and requirements to support instrumentation investment that will meet the requirements for an instrumented range. No completion date has been identified.

Northwest Training Range Complex Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Infrastructure	Strike Warfare (STW)	●	The range currently lacks instrumentation and there is no real-time or debrief capability. This increases personnel optempo; reduces realism; increases O&M costs; and inhibits tactics development. The Navy is reviewing an investment strategy and requirements to support instrumentation investment that will meet the requirements for an instrumented range. No completion date has been identified.
	Electronic Combat (EC)	●	NWTRC lacks air control capability or simulation capability, and does not currently have secure communications. FAA control of SUA results in delayed access, and the lack of air simulation capability causes loss of training and reduces realism. NASWI is in the process of gaining air control capability of Olympic MOAs and W-237. COMVAQWINGPAC has an in house configuration of MIDS and BOSS to provide some air simulation capability.
	Anti-Air Warfare (AAW)	●	NWTRC currently lacks air control capability or simulation capability. FAA control of SUA results in delayed access, and the lack of some sort of air simulation capability causes loss of training and reduces realism. NASWI is in process of gaining air control capability of Olympic MOAs and W-237. COMVAQWINGPAC has an in house configuration of MIDS and BOSS to provide some air simulation capability. The lack of secure communications would be solved with an operational LINK 16 the HAVEQUICK.
	Anti-Surface Warfare (ASUW)	●	Minimal water management capability scheduling and deconfliction only exist in W-237 for DDGs or small boats. Additionally, there is no control of surface areas designated within Puget Sound or the Strait of Juan de Fuca. Units do self coordination with local Commands for events that take place within the Strait of Juan de Fuca and Puget Sound.
Range Support	Strike Warfare (STW)	●	The lack of real-time and post-event modules precludes most efficient scheduling and documenting of range usage. Non-compliance or inaccurately reporting post-event values to regulators risks range events/access or prohibitions on training events that involve sonar or high explosives at sea. Scheduling issues reduce range access, prohibit certain training events, reduce realism, and segment training. PACFLT has developed a DCAST; however, the post-event module to mitigate issues outlined above has not been installed. The after action reporting module and real-time event module are also still to be installed.
	Anti-Air Warfare (AAW)	●	Same as above. Additionally there is no infrastructure in place to support AW training.
	Anti-Surface Warfare (ASUW)	●	Same as above. Additionally there is no infrastructure in place to support SUW training.
	Mine Warfare (MW)	●	Same as above. Additionally there is no infrastructure in place to support MIW training.
	Anti-Submarine (ASW)	●	Same as above. Additionally there is no infrastructure in place to support ASW training.
	Naval Special Warfare (NSW)	●	Same as above. Additionally there is no infrastructure in place to support NSW training.
	Expeditionary Warfare (EXW)	●	Same as above. Additionally there is no infrastructure in place to support EXW training.
Suite of Ranges	Electronic Combat (EC)	●	NWTRC Lacks air control capability or simulation capability. FAA control of SUA results in delayed access and lack of air simulation capability causes for loss of training and reduces realism. NASWI is in the process of gaining air control capability of the Olympic MOAs and W-237. COMVAQWINGPAC has an in-house configuration of MIDS and BOSS to provide some air simulation capability.
	Expeditionary Warfare (EXW)	●	The lack of an at sea crew served weapons range affects realism and weapons proficiency. This inhibits tactics development; reduces live-fire proficiency; segments training/testing, and reduces realism. The Navy has recommended a review of inshore water areas for a place to conduct crew served weapons training.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Northwest Training Range Complex Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Airspace	Strike Warfare (STW)	●	Presence of 450 foot tall wind turbines in Restricted Airspace and a 500 foot vertical and lateral clearance requirement causing pilots to adjust flight paths at about a mile from the obstruction in the vicinity of each wind turbine to maintain 1,000 feet vertical clearance. An established dairy farm in the NWSTF Boardman Arlington run-in to target area caused the loss of approximately 1 mile of run-in arming area for aircraft into the main target area. Wind energy projects reduce access, prohibit certain training events, segment training, reduce realism, and raise flight altitudes. Transmission lines cause obstacle avoidance and interrupts low altitude training. Continue to purchase restrictive easements from land owners. Continued funding for easement purchases is needed. Due to long administrative timelines, land owners may still build wind turbines if no easement is purchased. Additionally, the Navy, with the FAA, has established the Boardman Low MOA and extension of current Boardman MOA, making more airspace to the northeast and maintaining training capability lost in the southeast. Transmission lines currently mitigated to remain at or below 100 feet crossing NWSTF Boardman airspace.
	Electronic Combat (EC)	●	VQ Aircrews based at NAS Whidbey Island train in Electronic Reconnaissance in Darrington OPAREA. Due to commercial air traffic, Navy aircraft routinely experience difficulty getting clearance from Seattle ARTCC (FAA) to climb above Flight Level 250 (25,000 feet). Due to civilian traffic, Navy aircraft are routinely vectored around by Seattle ARTCC causing delays, wasting airborne training time. These restrictions result in reduced access to emitter located on OLF Coupeville. The Navy is currently establishing mobile EW training emitter systems to operate in MOAs such as the Okanogan, Roosevelt and Olympic MOAs. Additionally, the Navy is discussing and developing courses of action on establishment of additional training airspace.
	Anti-Air Warfare (AAW)	●	Same as Strike Warfare.
Foreign Access or Control	Strike Warfare (STW)	●	Navy is concerned with foreign intelligence collection opportunities resulting from a persistent foreign presence proximate to Navy operations, testing, and training equities ashore and at-sea. As previously stated in the 2025 Air Test and Training Range Enhancement Plan, "An emerging challenge is the increasing presence of foreign business interests in the vicinity of our sensitive test and training ranges." Foreign acquisition of real estate in close proximity to Northwest Training Range Complex, a critical training and testing range, offers the ability to maintain a permanent presence near areas vital to Navy missions and national security, and facilitate an opportunity to collect critical information regarding national defense programs. Additionally, foreign investment to acquire U.S. businesses that operate near Navy activities is another avenue for establishing a permanent presence that presents very unique mission compatibility challenges. Navy actively engages in CFIUS, Fleet Commanders, Navy Region Commanders, and community planner to evaluate the security risks of foreign investment acquisitions in proximity to DoD equities. Although Navy considers this to be a potential encroachment threat for all testing and training ranges, the Navy's CFIUS Office (Proximity), in close coordination with the mission owners, has tracked and monitored foreign investment activities near the Northwest Training Range Complex and many other key ranges.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.

Northwest Training Range Complex Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Land Use	Strike Warfare (STW)	●	Presence of 450 foot tall wind turbines in Restricted Airspace and a 500 foot vertical and lateral clearance requirement causing pilots to adjust flight paths at about a mile from the obstruction in the vicinity of each wind turbine to maintain 1,000 feet vertical clearance. An established dairy farm in the NWSTF Boardman Arlington run-in to target area caused the loss of approximately 1 mile of run-in arming area for aircraft into the main target area. Wind energy projects reduce access, prohibit certain training events, segment training, reduce realism, and raise flight altitudes. Transmission lines create avoidance areas, prohibit certain training events, and segment training/reduce realism. The solution is to continue to purchase restrictive easements and pursue REPI projects with land owners. Continued funding for easement purchases is needed. Due to long administrative timelines, land owners may still build wind turbines if no easement is purchased. Additionally, the Navy and the FAA have established the Boardman Low MOA and extension of current Boardman MOA making more airspace to the northeast maintaining training capability lost in the southeast. Transmission lines currently mitigated to remain at or below 100 feet crossing NWSTF Boardman airspace.
	Anti-Air Warfare (AAW)	●	Same as Strike Warfare.
	Anti-Surface Warfare (ASUW)	●	Small boat training in Crescent Harbor Naval Operations Area suffers occasional presence of recreational and small commercial fishing boats and SCUBA diving as the training areas are not restricted areas. Transient activity creates avoidance areas, prohibits certain training events, and segments training/reduces realism. The current work around is to have monitoring in place to watch out for the recreational and small commercial fishing boats and SCUBA diving. Requesting the nonparticipating boat to leave often solves the issue; however, delays and cancelation of the training event may occur if the non participating boat does not depart the area.
	Anti-Submarine (ASW)	●	OOS have been deployed by academic and commercial organizations in off-shore training and operating areas. The effect is that U.S. Navy submarines have been directed to remain clear of those areas. The exact size and location of these areas is classified. OOSs create avoidance areas, prohibit certain training events, and segment training/reduce realism. With establishment of the Neptune and Endurance arrays, DEVRON 5 reports no unit level training occurs off the coast of Washington and Oregon. There is no solution to the loss of training area. Navy has established the OOS Situational Awareness Office as the central clearinghouse to catalog and assess impacts of OOS. DEVRON 5 does basic level training in SOCAL and SUBGRU 9 does all basic level training in simulators.
	Naval Special Warfare (NSW)	●	EOD training in the Crescent Harbor and Hood Canal areas undergo occasional presence of recreational and small commercial fishing boats and SCUBA diving, as the underwater detonation training areas are not restricted areas. Transient activity creates avoidance areas, prohibits certain training events, and segments training/reduces realism. NAS Whidbey Island attempted to pursue establishing a restricted area within Crescent Harbor to restrict access to the underwater detonation range during training operations; however, establishing proved to be unattainable due to cost and the movement of EODMU-11 to California.
	Expeditionary Warfare (EXW)	●	Same as Naval Special Warfare.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Northwest Training Range Complex Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Maritime	Anti-Surface Warfare (ASUW)	●	Maritime protective and mitigation measures undertaken in compliance with regulatory requirements have resulted in training restrictions that reduce training flexibility, force segmented training, and ultimately reduce training realism. All at-sea training is impacted to some degree; impacts are most significant to integrated warfare training using active underwater acoustic sources or in-water explosive ordnance. The Navy and NMFS have developed science based protective and mitigation measures that adequately protect marine species while accommodating military readiness activities. The Navy continues to develop Environmental Impact Statements and obtain permits and authorizations for its range complexes to ensure military training complies with applicable laws and regulations. Litigation risks remain a concern, entailing the potential to delay or further restrict training, despite the protective and mitigation measures applied by the Navy in compliance with the MMPA and ESA. Endangered species/critical habitat encroachment has created avoidance areas that have resulted in some reduction of training days and prohibits certain training events. This area is relatively small in scope; however, if these types of restrictions were applied to other species/areas, there would be significant impacts to readiness through reduction in range access, segmentation of training/reduction in realism, limits on the application of new technologies, raised flight altitudes, reduced live fire proficiency, increased personnel tempo, and increased O&M costs. The Navy continues to invest in marine mammal research; rely on scientifically valid empirical data results as basis of marine mammal mitigation development; factor mitigation effectiveness into permit requests; and educate Fleet units to adhere to the maritime protective and mitigation measures and public education outreach efforts. Navy's authorizations under the MMPA and ESA include an adaptive management approach that includes continually evaluating existing mitigation measures for their potential impacts on training. If impacts on training from mitigation measures are identified and documented, Navy will raise these impacts with NMFS for resolution during an annual adaptive management review process. The Navy is currently preparing environmental compliance documentation to renew the MMPA and ESA authorizations which will consider any impacts on training stemming from existing mitigations measures and propose changes as warranted.
	Mine Warfare (MW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.
Other Regulatory Requirements	Anti-Surface Warfare (ASUW)	●	Wind energy projects in Restricted Airspace and FAA determination of no hazard will lead to loss of low altitude tactical training in NWSTF Boardman. Presence of 450 foot tall wind turbines in Restricted Airspace and a 500 ft. vertical and lateral clearance requirement in the vicinity of each wind turbine mandate that low altitude training in the Boardman airspace must be at least 1,000 ft. above ground level. The FAA determination allows wind turbine construction inside Restricted Airspace. Wind energy projects can reduce access; prohibit certain training events, segment training/reduce realism, and raise flight altitudes. The Navy recommends purchase of aviation easements from land owners or it must accept loss of training capability on an existing range. The Navy is pursuing the addition of a MOA joining current airspace in order to maintain training capability. If the Navy is unable to maintain training capability at NWSTF Boardman, it will recommend pursuing additional airspace elsewhere.
Range Transients	Anti-Submarine (ASW)	●	Commercial and private shrimp fishing boats congregate in Dabob Bay for several weeks in late April to mid June. Additionally, Native Americans fishing for clams & shrimp traverse across NUWC RDT&E ranges without contacting NUWC Operations, thereby interfering with ongoing events. Commercial vessel and recreational vessel encroachment create avoidance areas and segments training/reduces realism. The Navy will continue to pursue opportunities to inform industry and the public of the impact, of range transient encroachment, to Navy readiness.
	Naval Special Warfare (NSW)	●	Commercial and private shrimp fishing boats congregate in Hood Canal for several weeks in late April to mid June. Additionally, Native Americans fishing for clams & shrimp traverse across NUWC RDT&E ranges without contacting NUWC Operations, thereby interfering with ongoing events. Native American and civilian fishing boats occasionally inhibit EODMU-11 Detachment Bangor underwater detonation training in Hood Canal EOD training range. Native American and fishing activities create avoidance areas, prohibit certain training events, and segment training/reduce realism. Current workarounds include having monitoring in place to watch out for the recreational and small commercial fishing boats and SCUBA diving. Requesting the nonparticipating boat to leave often solves the issue; however, delays and cancellation of the training event may occur if the non participating boat does not depart the area.
	Expeditionary Warfare (EXW)	●	Same as above.

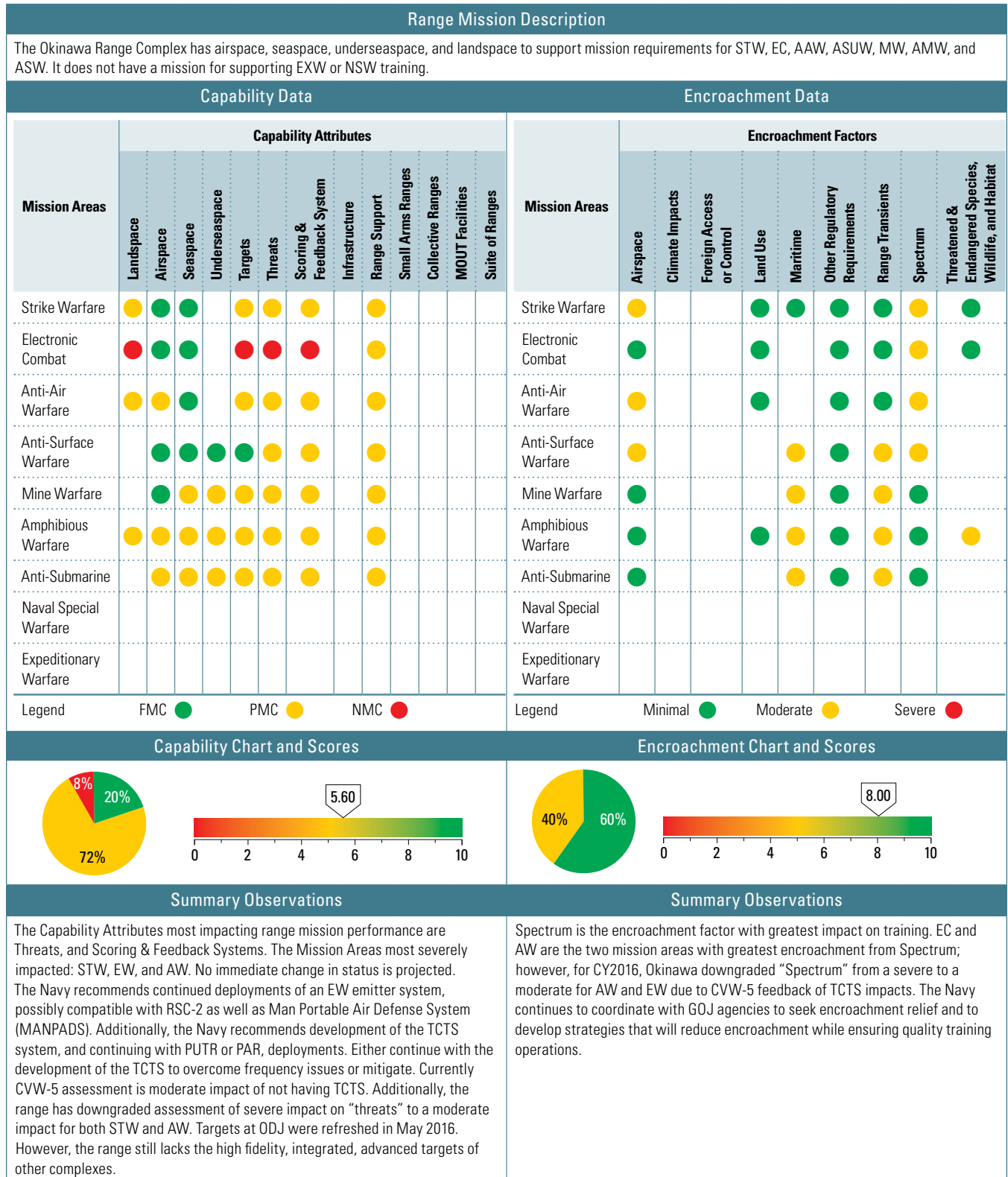
Northwest Training Range Complex Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Spectrum	Electronic Combat (EC)	●	Jamming is restrictive east of the Cascade Mountains (Okanogan and Roosevelt MOAs) due to satellite communications stations, etc. Additional jamming target sets have developed in current combat theaters that can not be jammed for training in inhabited areas. Restrictions from the Joint Restricted Frequency List and the FAA create avoidance areas, prohibit certain training events, segments training/reduces realism, limits application of new weapons technologies, and inhibits new tactics development. PNW EW Range will eventually solve basic FRS training needs; however, for advanced AEA training travel to NAS Fallon and Mountain Home AFB is still needed to complete Fleet Squadron sustainment and advanced EC training requirements. Restrictions on Surface Combatant radar (SPS-49) limit its use within 100 NM of land. Workarounds currently permit completion of training. PNW EW Range placement is underway for the Olympic MOA and W-237 area with possible future expansion into the Okanogan and Roosevelt MOAs. COMVAQWINGPAC noted that this may cause a need of airspace boundary adjustment to bring the Okanogan MOA 50 NM to the west. This will assist in aircraft transit times. This will be a cause for additional NEPA and public outreach. So far, this is just discussion for RCMP 2017 update; however, it could lead into more public and congressional concern. The PNW EW Range is passive only with no jamming. With passive EW range in place all TRs for the FRS will be met; however, Fleet training requirements will not be met and Fleet aircraft will still have to travel to NAS Fallon to complete.
Threatened & Endangered Species, Wildlife, and Habitat	Anti-Surface Warfare (ASUW)	●	Use of explosive munitions is not authorized within 50 NM from shore due to mammal mitigation, bird mitigation, and Olympic Coast NMS. These restrictions result in longer transit to training areas. Local units are now using explosive munitions 50 NM or more off shore.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Okinawa Assessment Details



Okinawa Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	4.90	5.00	5.10	5.10	5.10	5.20	Encroachment Scores	9.23	8.16	8.16	8.16	8.16	8.16
<p>ASW in 2009 Tracking & Scoring was Yellow and forward based on the availability of the PAR/PUTR which provides a partial capability for ASW training. In 2009, STW Targets were Red (no targets), re-evaluated to Yellow in 2010 through 2015 based on "limited" target availability. A target refresh at ODJ was completed in May 2016. TCTS is currently not available in Okinawa/7th Fleet due to RF restrictions. For CY2017, the range downgraded "Scoring and Feedback System" from a severe to a moderate for AAW due to CVW-5 feedback of TCTS impacts. The range also downgraded the severe impact to a moderate impact for "threats" for both STW and AW for similar reasons. Initial DESRON 15 message, to move the RSC-2 from Okinawa to mainland Japan was endorsed by CTF-70 and C7F and forwarded to CPF N7, who has approved the move pending funding to PMRF in FY2018. RSC-2 is under-utilized in Okinawa and will be used weekly by FDNF for SUW, USW ULT training events in R116/Sagami Wan training areas, and bilateral training. This alleviates the requirement to transit down to Okinawa for RSC-2 support services.</p>							<p>Encroachment assessments for CY2009 through 2015 reveal there has been little encroachment change from year to year, with relatively constant overall scores. There is little indication encroachment pressures will change in the foreseeable future. There are no emerging encroachment issues that affect Okinawa operations. The 2016 assessment remains the same as the previous years, with the exception of downgrading AW and EW "spectrum" encroachments from severe to moderate.</p>						

Okinawa Detailed Comments

Capability Observations








Attributes	Assigned Training Mission	Score	Comments
Landspace	Strike Warfare (STW)		The land area at this range is too small to accommodate STW training. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy will continue to investigate opportunities with other services. No completion date has been identified.
	Electronic Combat (EC)		The range has no land area that supports EW training and there are political and frequency spectrum constraints. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; increase personnel optempo; and increases O&M costs. The Navy recommends conducting feasibility study for EW assets to be incorporated into a high fidelity, inert, air-ground training range and continuing development of RSC-2 with EW assets, as long as RSC-2 is in Okinawa. No completion date has been identified.
	Anti-Air Warfare (AAW)		There is no overland airspace that supports AW training at Okinawa. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; increases personnel optempo; and increases O&M costs. The Navy will continue pursuing opportunities with other services. No completion date has been identified.
	Amphibious Warfare (AMW)		Range is not contiguous with the required size of beachfront area. The beach area is very limited and the area does not support NSFS. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; increases personnel optempo; and increases O&M costs. The Navy will continue pursuing opportunities with other services. No completion date has been identified.
Airspace	Anti-Air Warfare (AAW)		The range has no overland airspace that supports AW training. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; increases personnel optempo; and increases O&M costs. The Navy will continue pursuing opportunities with other services. No completion date has been identified.
	Amphibious Warfare (AMW)		The range has no airspace over beaches that meet training requirements. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; increases personnel optempo; and increases O&M costs. The Navy will continue pursuing opportunities with other services. No completion date has been identified.
	Anti-Submarine (ASW)		The range airspace is not supported by an Undersea Warfare Training Range. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; increases personnel optempo; and increases O&M costs. The Navy will continue the development and deployment of RSC-2 with PAR/PUTR capability.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Okinawa Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Seaspace	Mine Warfare (MW)	●	The range has insufficient geographic references and water is too deep for MW training. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; increases personnel optempo; and increases O&M costs. The Navy will continue pursuing opportunities with other services. No completion date has been identified.
	Amphibious Warfare (AMW)	●	The range is not contiguous with required size of beachfront area. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; increases personnel optempo; and increases O&M costs. The Navy will continue pursuing opportunities with other services. No completion date has been identified.
	Anti-Submarine (ASW)	●	The range seaspace is not supported by an USWTR. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; increases personnel optempo; and increases O&M costs. The Navy will continue development of PUTR capability. No completion date has been identified.
Underseaspace	Mine Warfare (MW)	●	Sufficient space exists at the range, but bottom type does not have required characteristics; water depth is too deep; no undersea warfare training range is available; no dedicated Shock Wave Action Generator (SWAG) training area; and there is no mine avoidance area. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; increases personnel optempo; and increases O&M costs. The Navy will continue pursuing opportunities with other services and evaluating the feasibility of installing a mine range with instrumented shapes, false targets, bottom mines, and mines approved for SWAG training. The Navy will also evaluate the feasibility of creating a shallow water OPAREA. No completion date has been identified.
	Amphibious Warfare (AMW)	●	The range is not contiguous with required size of beachfront area. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; increases personnel optempo; and increases O&M costs. The Navy will continue pursuing opportunities with other services. No completion date has been identified.
	Anti-Submarine (ASW)	●	The range's undersea space does not have significant areas with water less than 600 feet deep and it is not supported by an USWTR. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; increases personnel optempo; and increases O&M costs. The Navy will continue development and deployment of PUTR capability.
Targets	Strike Warfare (STW)	●	The range has limited targets available, though they were just replaced in May 2016. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy will continue pursuing opportunities with other Services and to work to procure high fidelity targets. No completion date has been identified.
	Electronic Combat (EC)	●	The range has no dedicated EW targets available. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; increases personnel optempo; and increases O&M costs. The Navy recommends conducting a feasibility study for EW assets to be incorporated into a high fidelity, inert, air-ground training range; also to continue pursuit of RSC-2 with EW assets.
	Anti-Air Warfare (AAW)	●	The range has no supersonic targets available and no dedicated targets available. This reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends increasing the availability of commercial air services and pursuing RSC-2 options. No completion date has been identified.
	Mine Warfare (MW)	●	While limited targets are available at the range, there are no dedicated targets that meet full training requirements. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; increases personnel optempo; and increases O&M costs. The Navy will continue pursuing opportunities with other services, evaluating the feasibility of installing a mine range with instrumented shapes, false targets, bottom mines, mines approved for SWAG training, and to evaluating the feasibility of creating a shallow water OPAREA. No completion date has been identified.
	Amphibious Warfare (AMW)	●	The range has no targets available to support AMW. This prohibits certain training events; reduces realism; limits application of new technologies; inhibits new tactics development; increases personnel optempo; and increases O&M costs. The Navy will continue pursuing opportunities with other services. No completion date has been identified.
	Anti-Submarine (ASW)	●	The range has no dedicated ASW targets available. As a result, units typically supply their own expendable targets. This reduces realism; limits application of new technologies; inhibits new tactics development; reduces live fire proficiency; and increases O&M costs. The Navy recommends increasing the availability of ASW targets via RSC-2 support.

Okinawa Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Threats	Strike Warfare (STW)	●	The range has no dedicated OPFOR available. This reduces realism; limits application of new technologies; and inhibits new tactics development. The Navy recommends improving the availability of CAS and the number and variety of threats; and continuing to pursue RSC-2 with EW capability.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
Scoring & Feedback System	Strike Warfare (STW)	●	No permanent instrumentation exists for this range. This reduces realism; limits application of new technologies; and complicates night and all weather training. The Navy recommends continuing planned deployment of TCTS and evaluating the potential to accelerate its deployment or cancel the TCTS effort, mitigate it and find an alternative. Currently, CVW-5 assessing a moderate vice severe impact to training from lack of TCTS.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
Range Support	Strike Warfare (STW)	●	The DCAST is in place and being utilized; data collection after action module is being activated in FY2017. The Navy needs to fully implement DCAST after action module.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Okinawa Detailed Comments

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Airspace	Strike Warfare (STW)	●	When civil or commercial air traffic is routed through or strays into SUA, the SUA is partially or fully shut down. Okinawa air operations must cease or be delayed until the range is cleared, surface to unlimited. These restrictions create avoidance areas, segment training, reduce realism, prohibit certain training events, reduce range access, reduce live-fire proficiency; and delay operations until range clears. The Navy continues close coordination with Okinawa aviation controllers which helps to ameliorate the impacts of SUA incursion by non-military aircraft.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
Maritime	Anti-Surface Warfare (ASUW)	●	Maritime protective and mitigation measures undertaken in compliance with regulatory requirements have resulted in training restrictions that reduce training flexibility, force segmented training, and ultimately reduce training realism. All at-sea training is impacted to some degree; impacts are most significant to integrated warfare training using active underwater acoustic sources or in-water explosive ordnance. The Navy and NMFS have developed science based protective and mitigation measures that adequately protect marine species while accommodating military readiness activities. The Navy continues to develop Environmental Impact Statements and obtain permits and authorizations for its range complexes to ensure military training complies with applicable laws and regulations. Litigation risks remain a concern, entailing the potential to delay or further restrict training, despite the protective and mitigation measures applied by the Navy in compliance with the MMPA and ESA. Endangered species/critical habitat encroachment has created avoidance areas that have resulted in some reduction of training days and prohibits certain training events. This area is relatively small in scope; however, if these types of restrictions were applied to other species/ areas, there would be significant impacts to readiness through reduction in range access, segmentation of training/ reduction in realism, limits on the application of new technologies, raised flight altitudes, reduced live fire proficiency, increased personnel tempo, and increased O&M costs. The Navy will continue to invest in marine mammal research; rely on scientifically valid empirical data results as basis of marine mammal mitigation development; factor mitigation effectiveness into permit requests; and continue education of Fleet units to adhere to the maritime protective and mitigation measures and public education outreach efforts. Navy's authorizations under the MMPA and ESA include an adaptive management approach that includes continually evaluating existing mitigation measures for their potential impacts on training. If impacts on training from mitigation measures are identified and documented, Navy will raise these impacts with NMFS for resolution during an annual adaptive management review process. The Navy is currently preparing environmental compliance documentation to renew the MMPA and ESA authorizations which will consider any impacts on training stemming from existing mitigations measures and propose changes as warranted.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
Range Transients	Anti-Surface Warfare (ASUW)	●	Okinawa government is increasing the pressure to return water space under W173D to local fishermen for various types of fishing. Illegal fishing and seaweed harvesting in exclusive use areas can prohibit certain training events, reduce range access, create avoidance areas, and reduce training days. Operations are delayed until the fishermen depart the area. CNFJ, at direction of OSD, entered into an agreement in July 2014 to allow fishermen access to a portion of W173D water space when not being used for training activities, which was approved by Joint Committee (as a carrot for the Governor to sign land reclamation bill for FRF). Fishermen have fully complied with the agreement and GoJ has asked for remainder of W173D water area and an additional fishing method. USFJ holding the new agreement to get GoJ actions in other areas on Okinawa.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.

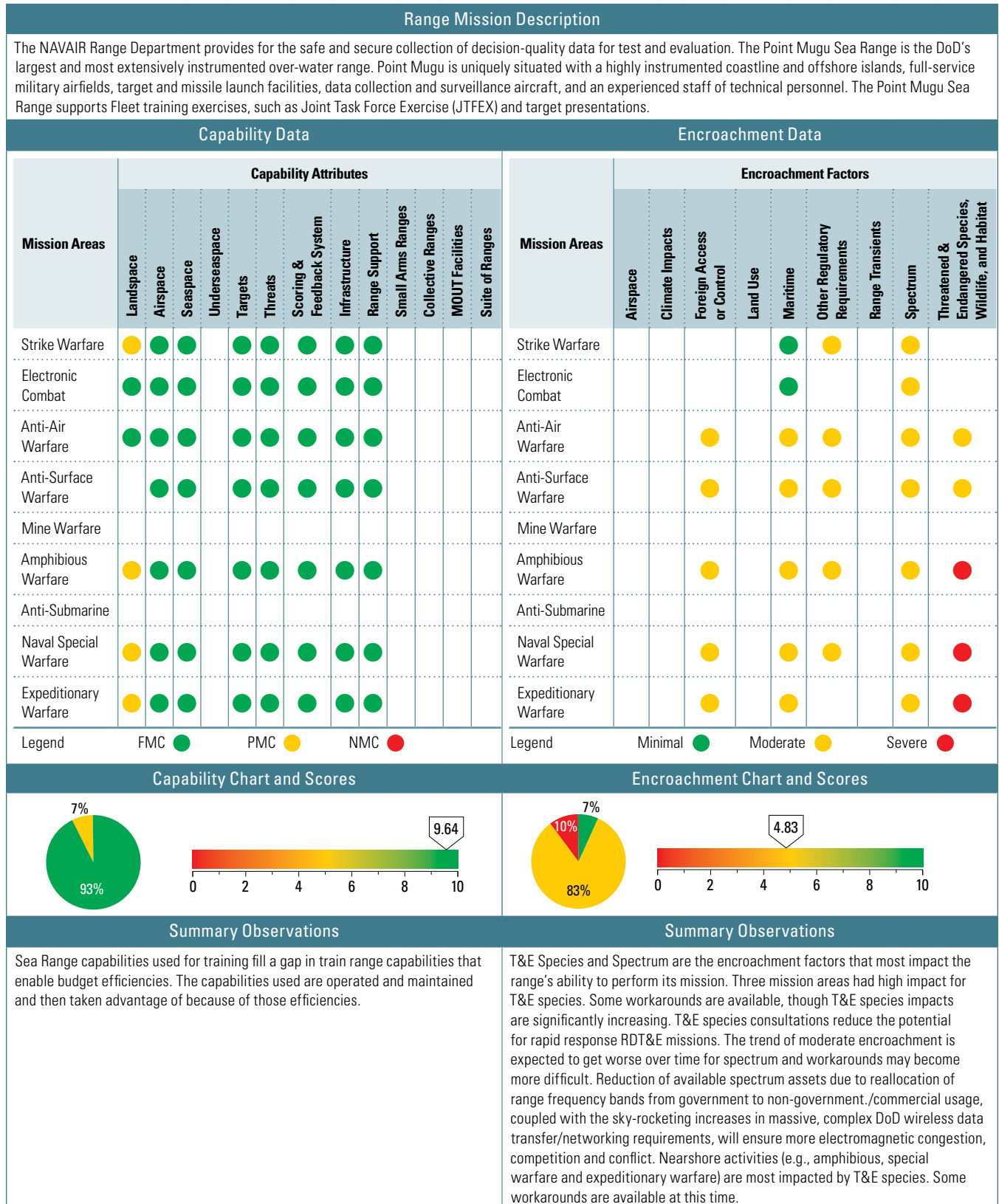
Okinawa Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Spectrum	Strike Warfare (STW)	●	Restrictions on RF emissions limit the use of the TCTS. Navy needs to continue pursuing the program or cancel the TCTS effort, mitigate it and find an alternative. Currently CVW-5 assessing a moderate vice severe impact to training from lack of TCTS. These restrictions limit spectrum operations and prohibit certain training events, segment training and reduce realism, reduce training days, limit application of new weapons technologies, and inhibit new tactics development. The Navy continues to coordinate with GOJ agencies to seek spectrum relief and to develop encroachment strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies.
	Electronic Combat (EC)	●	There are no EW training ranges due to RF restrictions. RF restrictions limit spectrum operations and prohibit certain training events, segment training and reduce realism, reduce training days, limit application of new weapons technologies, and inhibit new tactics development. Currently, CVW-5 assessing a moderate vice severe impact to training from lack of TCTS. The Navy continues to coordinate with GOJ agencies to seek spectrum relief and to develop encroachment strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies.
	Anti-Air Warfare (AAW)	●	Restrictions on RF emissions limit the use of the TCTS. Navy needs to continue pursuing the program or cancel the TCTS effort, mitigate it and find an alternative. Currently, CVW-5 is assessing a moderate vice severe impact to training from lack of TCTS. These restrictions limit spectrum operations and prohibit certain training events, segment training and reduce realism, reduce training days, limit application of new weapons technologies, and inhibit new tactics development. The Navy continues to coordinate with GOJ agencies to seek spectrum relief and to develop encroachment strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies.
	Anti-Surface Warfare (ASUW)	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Amphibious Warfare (AMW)	●	When the native dugong species is spotted, the Marines change tactics to avoid interacting with the dugong. Dugong live in the near-shore waters; thus, their presence can interrupt amphibious operations. Dugong protective measures create avoidance areas, prohibit certain training events, reduce range access, and segment training. Both the Navy and Marine Corps seek to avoid operating in the near vicinity of the dugong.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Point Mugu Sea Range Complex Assessment Details



Point Mugu Sea Range Complex Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	9.68	9.32	9.61	9.61	9.61	9.40	Encroachment Scores	9.51	8.78	8.78	8.78	8.78	5.34
Point Mugu Sea Range assessments and utilization have remained stable of the history of Sustainable Range reporting.							Eight test mission areas had moderate impacts. Workarounds were available at that time; however, the trend of moderate encroachment was expected to get worse over time for spectrum and workarounds may become more difficult. Spectrum is the encroachment factor that most impacted the range's ability to perform its mission. Reduction of available spectrum assets due to reallocation of range frequency bands from government to non-government/commercial usage, coupled with the sky-rocketing increase in massive, complex DoD wireless data transfer/networking requirements, will ensure more electromagnetic congestion, competition and conflict. Air and Sea Combat were the mission areas with the most moderate impacts. Workarounds were available at the time.						

Point Mugu Sea Range Complex Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Strike Warfare (STW)	●	One location on San Nicolas Island is the only land impact area on Point Mugu Sea Range and only for inert ordnance. This provides for only limited realistic training. There is no planned or feasible action to remedy the situation.
	Amphibious Warfare (AMW)	●	There are limited areas on San Nicolas Island and Point Mugu where this type of training can occur and only within limited seasons. This limits realistic training. There is no planned action to remedy the situation.
	Naval Special Warfare (NSW)	●	There are limited areas on San Nicolas Island and Point Mugu where this type of training can occur and only within limited seasons. Underwater detonations are not allowed. This limits realistic training. There is no planned action to remedy the situation.
	Expeditionary Warfare (EXW)	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Foreign Access or Control	Anti-Air Warfare (AAW)	●	Navy is concerned with foreign intelligence collection opportunities resulting from a persistent foreign presence proximate to Navy operations, testing, and training equities ashore and at-sea. As previously stated in the 2025 Air Test and Training Range Enhancement Plan, "An emerging challenge is the increasing presence of foreign business interests in the vicinity of our sensitive test and training ranges." Foreign acquisition of real estate in close proximity to Point Mugu Sea Range Complex, a critical training and testing range, offers the ability to maintain a permanent presence near areas vital to Navy missions and national security, and facilitate an opportunity to collect critical information regarding national defense programs. Additionally, foreign investment to acquire U.S. businesses that operate near Navy activities is another avenue for establishing a permanent presence that presents very unique mission compatibility challenges. Navy actively engages in CFIUS, Fleet Commanders, Navy Region Commanders, and community planner to evaluate the security risks of foreign investment acquisitions in proximity to DoD equities. Although Navy considers this to be a potential encroachment threat for all testing and training ranges, the Navy's CFIUS Office (Proximity), in close coordination with the mission owners, has tracked and monitored foreign investment activities near the Point Mugu Sea Range Complex and many other key ranges.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Point Mugu Sea Range Complex Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Maritime	Anti-Air Warfare (AAW)	●	Marine mammals and commercial shipping are present at Point Mugu. Testing that involves releasing military expendable materials into the water can only be conducted when the range is clear of marine mammals. Increasing numbers of marine mammals will likely cause increased impacts and delays to operations. Presence of commercial ships can delay or disrupt operations. The Navy adheres to standard marine mammal monitoring procedures and continues to document lack of impact from military operations on Point Mugu and work with regulators to change requirements. The Navy will continue to work with shipping industry and regulators to minimize shipping impacts.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.
Other Regulatory Requirements	Strike Warfare (STW)	●	California Air Resources Board (CARB) regulations require ships to burn low-sulfur fuel within 24 NM of the mainland and offshore islands. Vessel traffic initially increased through Point Mugu, with a significant potential to disrupt, delay, or cause cancellations to operations. CARB revised the initial regulation and some ships have returned to historic patterns. The overall trend, however, is not improving. Navy continues to track shipping traffic and work with CARB, the shipping industry, and other agencies to ensure they understand the importance of Point Mugu and potential for impacts. There are restrictions on discharge from the reverse osmosis water purification system that provides potable water to San Nicolas Island (SNI). The number of people that can be on SNI to support testing is limited by the water supply. Navy continues to work with regulators to modify the discharge permit.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
Spectrum	Strike Warfare (STW)	●	Reduction of available spectrum, coupled with the increase in spectrum requirements, limits the ability to schedule certain types of events and many concurrent activities. Coordination at the local level to deconflict when possible is effective. Users must work through the chain of command and Range Commanders Council to address spectrum requirements at the national level.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.

Point Mugu Sea Range Complex Detailed Comments

Encroachment Observations






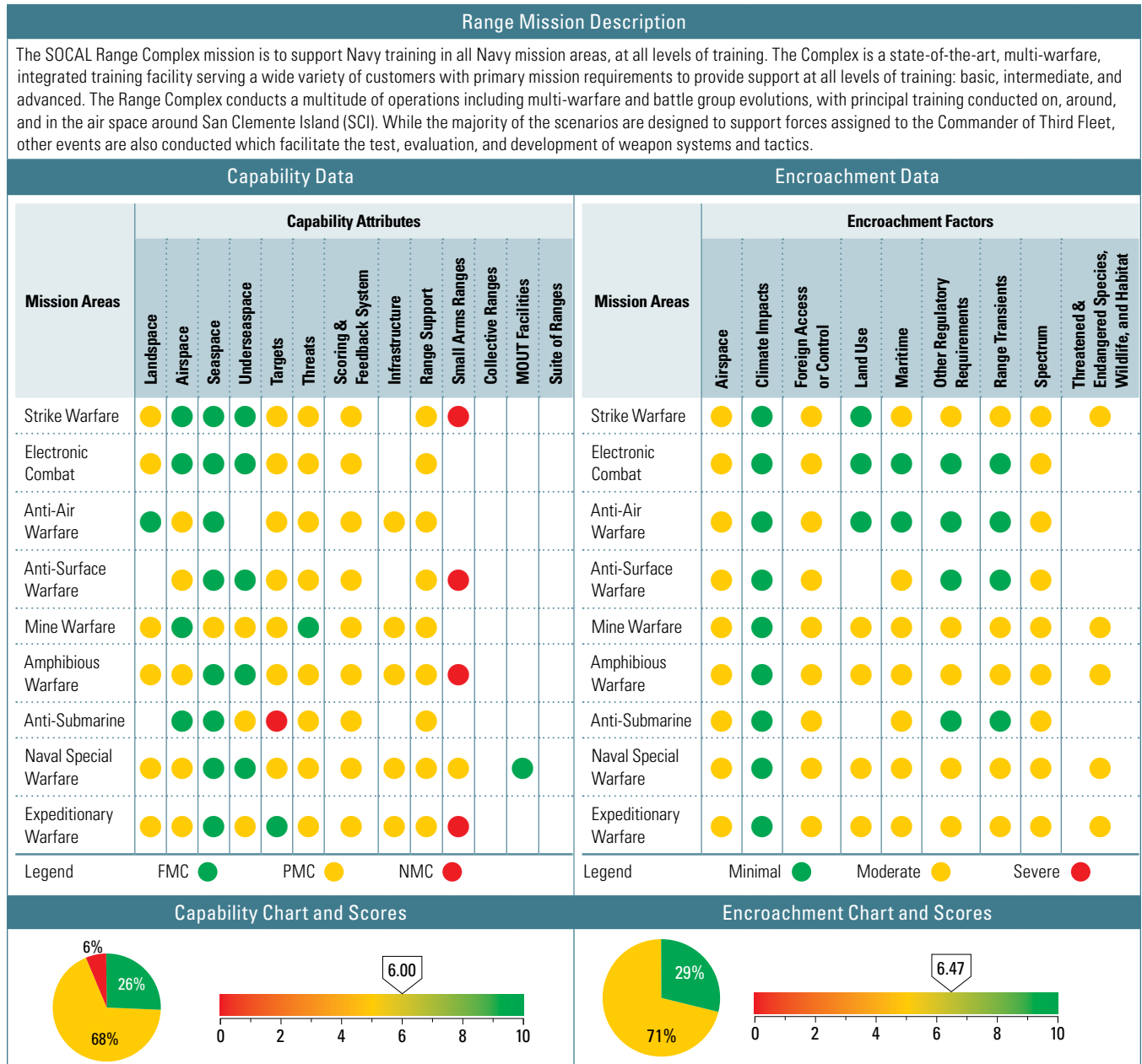
Factors	Assigned Training Mission	Score	Comments
Threatened & Endangered Species, Wildlife, and Habitat	Anti-Air Warfare (AAW)		Threatened and endangered species, wildlife, and habitat encroachment require significant resources and mitigation within the Point Mugu Sea Range. For example, NAVAIR maintains a Letter of Authorization for Northern elephant seals, Pacific sea lions, and Harbor seals harassed during missile launches from SNI requiring pinniped monitoring and reporting for every island launch. Additional monitoring and reporting for Southern sea otters around SNI is required by Congress to maintain compliance with ESA and MMPA exemption statutes. Black abalone and other intertidal monitoring is required to maintain a critical habitat exemption at SNI. Birds such as Western snowy plovers, Brants cormorants, and Brown pelicans impact access to some SNI beaches during nesting seasons. Some missions require plover surveys prior to beach access/operations. Nesting plovers at Point Mugu also threaten operational access to launch pads. The Point Mugu Sea Range is home to over 40 marine mammal species, many of which are threatened or endangered. Several biologically significant areas within the Point Mugu Sea Range are being considered for National Marine Sanctuary status.
	Anti-Surface Warfare (ASUW)		Same as above.
	Amphibious Warfare (AMW)		Same as above.
	Naval Special Warfare (NSW)		Same as above.
	Expeditionary Warfare (EXW)		Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Southern California (SOCAL) Assessment Details



Southern California (SOCAL) Assessment Details

Summary Observations							Summary Observations						
<p>The Capability Attributes most impacting range mission performance are Targets and Scoring & Feedback Systems, and Range Support. The Mission Areas most severely impacted are: ASW, AW, SUW, AMW, NSW, and MW. Limitations with Targets and Scoring & Feedback Systems are long-standing. The Navy continues to pursue solutions that improve and modernize the systems to reduce capability shortfalls.</p>							<p>Spectrum is the encroachment factor having the most effect on training. On January 29, 2015, the Federal Communications Commission (FCC) completed an auction in the 1755 – 1780 MHz. The reduction of available frequency spectrum precludes comprehensive employment of combat systems and sensors, specific training activity systems, and Command & Control and safety networks. Threatened and Endangered Species/Critical Habitat avoidance or minimization measures may require temporary use of alternate standards and/or methods to achieve training requirements. Operational training continues, but may be marginalized at times. Encroachment impacts are long-standing and are continually being addressed through management strategies to avoid, minimize, or mitigate potential impacts; to include NEPA actions and/or training procedures and protocols. Local installation Encroachment Action Plans are the blueprints for encroachment management and include engagement with stakeholders to resolve or minimize encroachment impacts.</p> <p>NSW Assessments: Assessments of NSW training are based on actual NSW demand and use of training range capability and space. Actual Training range capability and space requirements are based on Fleet Readiness Training Plan demands for conventional warfare areas.</p>						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	6.67	6.75	6.75	6.92	7.33	7.43	Encroachment Scores	9.06	8.57	8.15	7.27	7.27	6.87
<p>ASW Undersea space in 2008 was reassessed from Red to Yellow in 2009 and forward. Assessment of the impact was revised to more consistently reflect similar impacts in other range complexes. MW Targets and Scoring & Feedback Systems changed from Red to Yellow for 2012. Installation of fixed targets at Imperial Beach and Tanner Bank will provide rudimentary target support to MW forces, and Instrumentation equipment has been procured for the planned MW training range installation at Tanner Bank. The instrumentation system will primarily support submarine training. Range support changed from yellow to green for all warfare areas to reflect deployment and use of DCAST. AMW landspace and targets changed from red to yellow to reflect ability for amphibious forces to conduct battalion-level operations on SCI, to include all phases of MEU employment with the exception of overcoming beach obstacles and defenses. Small arms ranges to support OPNAVINST 3591.1F Category III (personnel who are issued weapons for combat support and expeditionary operations) and Category IV (personnel who are issued weapons for special missions, including ship's company force protection and visit, board, search and seizure (VBSS) personnel; explosive ordinance disposal teams in support of special operations forces; and convoy support personnel) has been deficient in Southern California since it was identified in the 2013 revision of the Southern California RCMP. This training currently cannot be accomplished in the San Diego Fleet Concentration Area. Advanced parachute training for NSW and EOD is not available in the mainland in the Southern California Range Complex due to air traffic control airspace restrictions.</p>							<p>Since the CY2013 submittal, considerable review and coordination on encroachment issues in the SOCAL Range Complex has occurred between the SOCAL Range Complex Management Plan revision, local installation Encroachment Action Plan updates, and initiation of the SOCAL OPAREA Encroachment Action Plan. Key changes to this CY2016 revision include: designation of green or yellow across all warfare areas; yellow for all warfare areas in Airspace and Spectrum; change of red to yellow for cultural resources on SCI for AMW due to detailed planning for assault vehicle maneuvers and ability to avoid significant archaeological sites, yellow for most warfare areas for Maritime due to sonar and underwater detonation (UNDET) measures from HSTT EIS and commercial and recreational vessels; yellow for noise restrictions for EXW and NSW blank gunfire, pyrotechnics, and helicopter use; and designation of yellow for Other Regularity Requirements for MIW, AMW, EXW, and NSW due to potential impacts as a result of periodic Tijuana River pollution impacts on SSTC waters; and yellow for land uses due to AMW, EXW, MIW, and NSW training near public areas. For the two new encroachment issues (Climate Impacts, Foreign Access or Control), the SOCAL Range Complex has indicated greens across the board. The atypical five years of drought and record rain and snow for 2016-2017 have not impacted training in SOCAL. There is little indication that major encroachment pressures will change substantially in the foreseeable future.</p>						

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Southern California (SOCAL) Detailed Comments

Capability Observations			
Attributes	Assigned Training Mission	Score	Comments
Landscape	Strike Warfare (STW)	●	SHOBA cannot support two separate concurrent strikes, and the use of live ordnance is limited to specific areas of the range complex. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. There is no solution except to use other ranges. No completion date has been identified.
	Electronic Combat (EC)	●	The landmass associated with SCORE's EW range, is 4 NM by 20 NM, and falls short of the threshold 10 NM by 10 NM as well as the required capability objective of 20 NM by 20 NM. There is no degradation in training as a result of this shortfall. There is no solution except to use other ranges.
	Mine Warfare (MW)	●	Limited availability of and restrictions on Very Shallow Water (VSW) and surf zone mine warfare restricts full implementation of mine shape detection and neutralization training requirements. Proximity to the public and nearshore training for several commands, restricts the ability to establish a permanent minefield in VSW and surf zone environments. In addition, proximity to the public (Imperial Beach community) precludes EOD from conducting realistic Raise, Beach, and Tow (with mine shape neutralization) training. Although beaches in SHOBA can support VSW and surf zone MW training, the presence of UXO in these waters restricts the ability of SPAWAR to utilize Mk V for seeding and maintaining minefields in this area. These restrictions create the requirement to inject administrative shifts in the training scenario, which reduces realism, restricts new tactics development, reduces live fire proficiency, and increases PERSTEMPO and associated temporary additional duty (TAD) costs. The Navy is assessing using local EODMU support to detect and Blow In Place (BIP) UXO located off SHOBA. Consideration has been given to designating certain/all SSTC boat lanes under formal rule making as restricted water space, and then identifying a specific location in the boat lanes that can support Raise, Beach and Tow MW.
	Amphibious Warfare (AMW)	●	Within SOCAL there are many beaches at SCI and at SSTC with varying lengths from 1,000 to 5,000 yards. These beaches fall short in size of RCD requirements; however, they do support amphibious landings although they have limited maneuver space extending inland from the beach. At SCI, rugged terrain from the beachheads and lack of accessible beaches (due to UXO) constrain amphibious landings and land area for tracked vehicle maneuvers. The SCI assault vehicle maneuver corridor (AVMC) to support USMC Battalion Landing maneuver exercises has been partially implemented; however, Navy leadership has determined that the Navy is not chartered to fund AVMC improvements, and Marine Corps leadership will need to determine a funding source to design and build the remaining AVMC improvements to fully implement use of the AVMC. SSTC land use for AMW is usually limited to individual and basic level training; larger MPF amphibious events are conducted but no JLOTS are currently conducted. Training impact from the limited number of landing beaches in SOCAL reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; and increases O&M costs. Following the completion of the soil erosion plan and revision of the USMC scheme of maneuver on SCI, specific improvements, such as gravel maneuver roads, avoidance of cultural resources and sensitive natural resources sites, have resolved SCIRC tracked vehicle maneuver constraints in support of low and medium erosion potential training areas. Areas assessed as high erosion potential were not carried forward for analysis and mitigation. However, funding has yet to be procured. For larger amphibious operations on SSTC, more extensive public outreach and additional space on other installations will be need to be coordinated as there is not enough beach space to accommodate of components of a JLOTS, including tent camp, laid down areas, and maneuver areas.
	Naval Special Warfare (NSW)	●	SCIRC has limited maneuver area and limited beach front areas. Basic and unit level training is accomplished, but additional land is required for more advanced training and live-fire training for over-the-beach exercises. There is no dedicated 360 degree maneuver area with a beachfront. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends investing in live-firing range areas along SCI shoreline to support over-the-beach exercises. No completion date has been identified.
	Expeditionary Warfare (EXW)	●	SCIRC land area for EXW is limited due to lack of established bivouac area and off-road maneuver areas. There are no Navy-controlled demolition ranges in the San Diego Fleet Concentration Area that allow for the detonations of an appreciable NEW within 60 miles of Metro San Diego. Additionally, there are no 360-degree live fire small arms ranges capable of supporting up to .50-cal machine gun fire in the San Diego Fleet Concentration Area. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel up-tempo; and increases O&M costs. Implementation of the soil erosion measures, UXO clearance, and funding natural and cultural resources surveys will resolve SCIRC limitations. SOCAL RCMP recommends CNRSW assess suitable facility for EOD demo pit. Siting study is required for an EOD demolition pit.

Southern California (SOCAL) Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Airspace	Anti-Air Warfare (AAW)	●	The lack of FAA-approved SUA between the mainland and W-291, coupled with the growing civilian and commercial air traffic, prohibits flying UAS from training areas situated on the Southern California coastline to the offshore Warning Area. This prohibits realistic tactical deployment and development of growing UAS technology as a force multiplying asset for ISR. The Navy will develop a mission requirements-based proposal and coordinate with FAA on the establishment of a UAS corridor between the mainland and W-291 for dedicated military training.
	Anti-Surface Warfare (ASUW)	●	Lack of a Warning Area (0-5000 feet) under CE1177 threatens continued ASUW live fire training. Airspace above the northern portion of the in-water instrumented hydrophone array is not restricted to the public, but use of this airspace is critical to full utilization of the SCI Training Range Complex capabilities. Restrictions on use of this airspace would increase optempo pressure on airspace above the southern portion of the hydrophone array, whereby, limiting the number and types of operations that could be scheduled in what is already an extremely high demand training area. The Navy will work with the FAA to establish W-293 in the airspace above and in proximity to the in-water hydrophone array (0-5000 feet). In the meantime, the Navy will continue to issue NOTMARs during training.
	Amphibious Warfare (AMW)	●	AMW operations occur on SCI around which all airspace requirements are met or exceeded with the exception of supersonic capability for intermediate and advanced training, which is not allowed within 30 NM of land, and the 10 NM overland horizontal and inland from the beachfront limits. Similar airspace volume and supersonic limitations apply to AMW airspace in the SSTC. Emergent and future expanded airspace requirements for AMW supporting fires, to include HIMARS and extended range guided munitions, will exacerbate the current airspace thresholds in SOCAL AMW training areas. No degradation in training results from this shortfall, and there is no solution except to use other ranges.
	Naval Special Warfare (NSW)	●	The inability to support advanced NSW parachute (particularly HALO) training in the SOCAL area exists due to air traffic control airspace restrictions on the mainland. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends establishing a full spectrum NSW parachute training facility within close proximity to Fleet Concentration Area San Diego that can persistently support advanced NSW parachute training.
	Expeditionary Warfare (EXW)	●	The inability to support advanced EOD parachute training in the SOCAL area exists due to air traffic control airspace restrictions on the mainland. These restrictions reduce realism; inhibit new tactics development; limit application of new weapon technologies; reduce live fire proficiency; increase personnel optempo; and increase O&M costs. The Navy recommends establishing a full spectrum EOD parachute training facility within close proximity to Fleet Concentration Area San Diego that can persistently support advanced NSW parachute training.
Seaspace	Mine Warfare (MW)	●	Limited availability of and restrictions on VSW and surf zone mine warfare restricts full implementation of mine shape detection and neutralization training requirements. Proximity to the public and nearshore training for several commands restricts the ability to establish a permanent minefield in VSW and surf zone environments. In addition, proximity to the public (Imperial Beach community) precludes EOD from conducting realistic Raise, Beach, and Tow (with mine shape neutralization) training. Although beaches in SHOBA can support VSW and surf zone MW training, presence of UXO in these waters restricts the ability of SPAWAR to utilize Mk V for seeding and maintaining minefields in this area. These restrictions create the requirement to inject administrative shifts in the training scenario, and this reduces realism, restricts new tactics development, reduces live fire proficiency, increases PERSTEMPO, and associated TAD costs. Assessing using local EODMU support to detect and BIP UXO located off SHOBA. Consideration is being given to designating certain/all SSTC boat lanes under formal rule making as restricted water space, and then identifying a specific location in the boat lanes that can support Raise, Beach and Tow MW.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)**Southern California (SOCAL) Detailed Comments****Capability Observations**

Attributes	Assigned Training Mission	Score	Comments
Underseaspace	Mine Warfare (MW)	●	Minefield training in shallow water through the surf zone that supports live firing of MCM systems and EOD ordnance and mechanical cutters is available, albeit without mine shape instrumentation. The availability of a fully instrumented VSW MW range is critical to the EOD mission in support of both MW and AMW. The lack of SWTR instrumentation reduces realism, inhibits new tactics development, and limits application of new weapon technologies. A VSW training on SSTC has been set up in the SSTC; however, no instrumentation is available; though VSW UNDETs can occur on SSTC. A VSW mine training area is being developed in SCI SHOBA waters that could support most of EOD MCM training and other emergent MCM systems. No completion date has been identified.
	Anti-Submarine (ASW)	●	Although the installation and operation of a Shallow Water Training range (SWTR) was approved in the 2009 Southern California EIS/OEIS and carried forward in the follow-on Hawaii/SoCal Training & Testing EIS/OEIS, the shallow water extensions in the SCI Training Range Complex have not been funded or installed. This inhibits absolutely critical shallow water tactics development; prohibits use of shallow water detection and track technologies; and restricts proficiency on weapon employment against a shallow water target. The Navy will continue to place a high priority on funding the in-water SWTR instrumentation in CPF N7's annual Tactical Training Range POM. The Navy is also installing a temporary nearshore portable tracking range off SCI that will provide limited deep to shallow water tracking capability.
	Expeditionary Warfare (EXW)	●	Minefield training in shallow water through the surf zone that supports live firing of MCM systems and EOD ordnance and mechanical cutters is available, albeit without mine shape instrumentation. The availability of a fully instrumented VSW MW range is critical to the EOD mission in support of both MW and AMW. The lack of SWTR instrumentation reduces realism, inhibits new tactics development, and limits application of new weapon technologies. A VSW training on SSTC has been set up in the SSTC; however, no instrumentation is available; though VSW UNDETs can occur on SSTC. A VSW mine training area is being developed a fully instrumented VSW mine training area in SCI SHOBA waters that could support most all facets of EOD MCM training and other emergent MCM systems. No completion date has been identified.

Southern California (SOCAL) Detailed Comments

Capability Observations









Attributes	Assigned Training Mission	Score	Comments
Targets	Strike Warfare (STW)		Range has no moving land targets, a limited number of structural targets, and inadequate Designated Mean Point of Impact at each site. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends investing in smart targets and upgrades to current targets. No completion date has been identified.
	Electronic Combat (EC)		Continuous advancements in adversary capabilities with respect to the use and denial of EW spectrum have resulted in a significant and urgent need for improved EW training capabilities, broken down into Anti-Access/Area Denial, Electronic Attack (EA), and Electronic Surveillance (ES). Communication and GPS denial/jamming systems need to be upgraded to ensure coverage of all existing communication frequencies, including Link 16 and GPS. Sufficient infrastructure is needed to realistically mimic real world adversary use of the information environment through the use of scripting (to include internet simulations). The adversary internet environment should be capable of generating various bandwidths of internet traffic including e-mails, simulated social media posts, as well as social media profiles, groups, posts, comments, and feeds. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends investing in reactive smart targets, ground-based jammers of sufficient power output, over the horizon radar simulator, and cyberspace-contested environment capabilities.
	Anti-Air Warfare (AAW)		SCORE has no permanently supported Aerial Target Command and Control (C2) capability and cannot consistently support BQM-74 target operations until installation of Standard Navy Target Control (SNTC) system. The range has no supersonic targets or targets with jamming capability and has altitude restrictions. The lack of C2 and supersonic targets increases Fleet Training costs (requires use SYSCOM RDT&E range), prohibits training; inhibits new tactics development; and restricts application of new weapon technologies. The Navy recommends expediting introduction of SNTC to FACSAC Det SCORE; investing in supersonic targets and additional drones with active jamming capabilities. No completion date has been identified.
	Anti-Surface Warfare (ASUW)		The range lacks modernized surface targets, especially Fast Attack Craft / Fast Inshore Attack Craft (FAC/ FIAC). Limited target arrays reduce realism; inhibit new tactics development; limit application of new weapon technologies; reduce live fire proficiency; increase personnel optempo; and increase O&M costs. The Navy recommends investing in upgraded, modernized surface targets in sufficient numbers to complete training requirements. FAC/FIAC should be procured to increase training opportunities against realistic surrogate targets. No completion date has been identified.
	Mine Warfare (MW)		Imperial Beach Minefield, a shallow water minefield, and a mid-depth (and deep-water) minefield on Tanner Bank contain respectively, 38 to 40 non-instrumented, threat-representative shapes in specified field configurations in support of emergent MW (mine hunting, influence sweeping) training. Both fields contain bottom and tethered mine shapes in accordance with SUBPAC and SMWDC requirements. However, due to excessive costs (i.e. Virtual Exercise Mine (VEM)), the minefields do not contain instrumented mine shapes. OPNAV N433 is the resource sponsor for MCM ranges (as of February 2010); investment in SOCAL MCM ranges (in accordance with SOCAL MCM POM 12 Proposal) is a fully-funded line item in the FYDP. However, the proposal did not contain specifications for instrumented targets. The lack of instrumented targets inhibits new tactics development, reduces training proficiency, and limits application of new weapon technologies. The lack of responsive instrumentation reduces realism of training by lack of opposition. The SOCAL Working Group prioritized establishing fixed MCM training ranges in SOCAL and retained proposals for instrumented shapes as part of out-year planning. The Navy recommends investing in expanding existing shallow and mid- to deep-water mine fields with instrumented mine threat composition targets. No completion date has been identified.
	Amphibious Warfare (AMW)		The required target types are not all available to this range, specifically beach obstacles and beach defenses. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends funding and installing exposed and submerged targets and beach obstacles that may be engaged with live ordnance. No completion date has been identified.
	Anti-Submarine (ASW)		Current MK-30 Mod 1 and MK-39 EMATT targets do not provide accurate response to AN/AQS-22 or AN/SQQ89 ASW Combat System sonar waveforms. Neither the MK-30 Mod 1 or MK-39 EMATT possess the capability of representing a dynamically maneuvering threat submarine. MK-30 Mod 1 units are approaching the end of service lifetime and Mk 30 mod 2 program was cancelled in 2012, whereby, limiting target availability and degrading ASW/USW unit level through integrated training. Number of targets required for training is increasing in excess of available MK-30 and MK-39 allocations. Lack of realistic ASW targets reduces realism and limits use of new technologies. The Navy recommends funding the development and procurement of modern ASW targets that provide accurate response to USN ASW sensors and are capable of simulating current ASW threats. In the meantime, the Navy also recommends procuring sufficient ASW targets capable of supporting the full spectrum of platform and sensor training requirements and increase opportunities to use of live submarines targets to fulfill training requirements. No completion date has been identified.
	Naval Special Warfare (NSW)		No range targets meet requirements, specifically beach obstacles and beach defenses. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends investing in a wide range of NSW required targets. No completion date has been identified.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Southern California (SOCAL) Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Threats	Strike Warfare (STW)	●	There is no dedicated threat aircraft and threats are not available in required quantity. There is limited UAS OPFOR for track and limited capability for engage or Blue UAS Over-watch training. EC threats are not available above level 2. There is no capability for virtual threat aircraft. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends investing in cost-effective, targets for track and engage and destruct at the ULT through integrated training; develop LVC threat capabilities. No completion date has been identified.
	Electronic Combat (EC)	●	Realistic OPFOR responses are not available and EC threats are not available above level 2. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends investing in enhanced EC threat capabilities. No completion date has been identified.
	Anti-Air Warfare (AAW)	●	The range has no dedicated threat aircraft and threats are not available in required quantity; this is particularly the case for F-35 aircraft. Limited UAS OPFOR for track; no capability for engage or Blue UAS Over-watch training. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends investing in contract air threat OPFOR with EC augmentation. No completion date has been identified.
	Anti-Surface Warfare (ASUW)	●	There are insufficient numbers of surface threats for realistic FAC/FIAC and ILFE at the integrated level and no threats available for ULT. This reduces realism and personnel expertise; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends investing in cost effective, realistic surface threats and augment Point Mugu Sea Range with educated target threat maintenance and repair personnel.
	Amphibious Warfare (AMW)	●	There is no live, virtual, or constructive threat ground force; EC threats are not available above level 2. Limited UAS OPFOR for track; no capability for engaging multiple threats. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends investing in enhanced EC threat capabilities. No completion date has been identified.
	Anti-Submarine (ASW)	●	The range has no dedicated threat aircraft, submarines, or surface ships; threats are not available in required quantity; and EC threats not available above level 2. There is no capability for virtual threat aircraft. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends investing in enhanced EC threat capabilities. No completion date has been identified.
	Naval Special Warfare (NSW)	●	The range has no live, virtual, or constructive threat ground force. There is limited UAS OPFOR for track; and there is no capability for engaging multiple threats. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends investing in enhanced EW threat capabilities. No completion date has been identified.
	Expeditionary Warfare (EXW)	●	Same as above.

Southern California (SOCAL) Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Scoring & Feedback System	Strike Warfare (STW)	●	There is no M&S capability; and no scoring capabilities as mandated in the RCD. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends investing in M&S systems. No completion date has been identified.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	There are no instrumented training mine shapes employed in SOCAL minefields; all shapes are inert. Additionally, the Tanner Bank minefield instrumentation needs repair. The Navy plans to replace the Tanner Bank minefield instrumentation and procure instrumented targets for the remaining minefields.
	Amphibious Warfare (AMW)	●	There is no M&S capability and no scoring capabilities as mandated in the RCD. This reduces realism; inhibits new tactics development; limits application of new weapon technologies; reduces live fire proficiency; increases personnel optempo; and increases O&M costs. The Navy recommends investing in M&S systems. No completion date has been identified.
	Anti-Submarine (ASW)	●	There is a lack of instrumentation of the West Coast SWTR. Absent in-water track and communication capability on the nearshore shelf and offshore Tanner/Cortez Banks in the SCIRC, SCORE cannot support (track and score) ASW operations in littoral and shallow water. In preparation for this requirement, SWTR was included in the SOCAL EIS/OEIS(ROD 2009). The continued lack of SWTR instrumentation reduces the accuracy of live training; inhibits new tactics development; limits application of new weapon technologies; and restricts proficiency. The Navy recommends investing in instrumentation for a Shallow Water Training Range off western side of San Clemente Island and over Tanner/Cortez Banks. Estimated FOC is 2027 - this is thirty-two years (32) after COMTHIRDFLT first documented the requirement.
	Naval Special Warfare (NSW)	●	Same as Strike Warfare (STW).
	Expeditionary Warfare (EXW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)**Southern California (SOCAL) Detailed Comments****Capability Observations**

Attributes	Assigned Training Mission	Score	Comments
Infrastructure	Anti-Air Warfare (AAW)	●	SCI does not have a permanent BQM launch facility. Current launch location is on the Naval Auxiliary Landing Field SCI Red label area and is operating under a one-year CNO explosive safety waiver. This impacts island operations in the near-term and long term is not sustainable because the explosive safety waiver will expire. The Navy has identified an alternate launch site off the Red label Area that can be developed as a permanent BQM launch site. Developing a second and last request for a two-year, CNO explosive safety waiver. Developing an EA and conducting formal consultation in support of Phase I of the BQM launch site development; Phase II will be addressed in follow-on EA for expanding island-wide operations and training.
	Mine Warfare (MW)	●	Effective development and maintenance of cantonment area infrastructure, such as berthing, galleys, classrooms, maintenance facilities, and ammunition handling facilities, enables range users to more efficiently utilize nearby range systems. SCI Roads are critical to the servicing of every facet of range systems, as well as targets and target areas. The degraded network of roads on SCI precludes comprehensive access for safety, firefighting, and maintenance vehicles; inhibits mobile target placement; restricts military access to training areas; and poses a safety hazard to military personnel. Training area support systems demand a continuous, reliable, on-demand power in order to meet area scheduling requirements. In accordance with OPNAVINST 4715.11, UXO management is critical to facilitate open and expanding training venues. Coordinating BOS/ROS functions on SCI, SSTC, Remote Training Site Warner Springs, Camp Michael Monsoor, and Camp Morena is critical to sustaining training across the majority of warfare areas. These infrastructure shortfalls reduce realism; inhibit new tactics development; limit application of new weapon technologies; reduce live fire proficiency; increase personnel optempo; and increase O&M costs. The Navy recommends all stakeholders participate in the annual Naval Base Coronado Class I/II funding process to provide input to prioritize range-related BOS; maintain a prioritized range-related BOS/O&MN list for end-of-year funding; implement the 2016 Naval Base Coronado (NBC) SCI Maintenance EA for utilities and roads, which includes a maintenance program for upgrading and increasing efficiencies of utility services; fund an aggressive, upgraded program to provide for expansive UXO mitigation across SCI land and offshore littoral waters of the SOCAL Range Complex in support of expanded access to critical training areas; and to ensure the safety of range support personnel and the training audience.
	Amphibious Warfare (AMW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.

Southern California (SOCAL) Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Range Support	Strike Warfare (STW)	●	Current range control on SCI is limited by aging facilities, lack of appropriate management systems and sensors, and limited manning. As such, the SCI Range Coordination Center has limited hours of operation, does not have a full common operating picture of all training activities conducted on SCI, and relies on scheduling to deconflict activities that occur outside of working hours. No Fleet Range Safety Officer is designated to coordinate and advise stakeholders on appropriate safety issues. An unacceptable number of safety-related close calls between live fire operations and military and non-military personnel represent a mounting safety concern on the sustained use of SCI for an ever-increasing number and complexity of training events and live fire activities. Recommend funding the Range Control Center to a modern facility with appropriate staffing and equipped with the necessary systems and sensors to adequately manage all current and future DoN and Joint training activities full-time. Designating a Fleet Range Safety Officer for SOCAL Range Complex would provide an individual for all stakeholders to coordinate and advise stakeholders on appropriate safety issues.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	There is a requirement for persistent, on-island Range Control of San Clemente Island ranges and training areas. SCORE provides some aspects of range control through their scheduling process. SCORE is not resourced or chartered to provide access control or physical security to the island and ranges and training areas. While CINCPACFLT 112353Z FEB00 assigned overall operational authority to SCORE for San Clemente Island, changes in Navy structure (CNIC, USFF) significantly altered SCORE's ability to provide required oversight and coordination. SCORE has stood up a Range Coordination Center capability in August 2013. The lack of 24/7 Range Control on SCI and its ranges and training areas exacerbates safety concerns, reduces range efficiency, and restricts range usage data collection requirements. SOCAL/NOCAL Fleet Project Team consensus was reached in August 2011 on the requirement for a centralized Range Control Center (RCC) for SCI. The Navy recommends fully funding the RCC for SCI.
	Mine Warfare (MW)	●	The lack of instrumentation within shallow water minefields precludes MW range instrumentation and underwater communications. The lack of minefield instrumentation reduces realism, inhibits new tactics development, and limits application of new weapon technologies. The Navy recommends funding instrumentation of West Coast minefields. No completion date has been identified.
	Amphibious Warfare (AMW)	●	Same as Anti-Surface Warfare (ASUW).
	Anti-Submarine (ASW)	●	The lack of instrumentation within shallow water ASW training areas precludes required full spectrum ASW training through range instrumentation and underwater communications. Lack of shallow water instrumentation reduces realism, inhibits new tactics development, and limits application of new weapons technologies. Recommend funding instrumentation of permanent shallow water ASW training range. No completion date has been identified. In the meantime, a temporary PUTR instrument array is slated for installation off of San Clemente Island in July 2017.
	Naval Special Warfare (NSW)	●	Current range control on SCI is limited by aging facilities, lack of appropriate management systems and sensors, and limited manning. As such, the SCI Range Coordination Center has limited hours of operation, does not have a full common operating picture of all training activities conducted on SCI, and relies on scheduling to deconflict activities that occur outside of working hours. No Fleet Range Safety Officer is designated to coordinate and advise stakeholders on appropriate safety issues. An unacceptable number of safety-related close calls between live fire operations and military and non-military personnel represent a mounting safety concern on the sustained use of SCI for an ever-increasing number and complexity of training events and live fire activities. Recommend funding the RCC to a modern facility with appropriate staffing and equipped with the necessary systems and sensors to adequately manage all current and future DoN and Joint training activities full-time (24/7). Designating a Fleet Range Safety Officer for SOCAL Range Complex would provide an individual for all stakeholders to coordinate and advise stakeholders on appropriate safety issues.
	Expeditionary Warfare (EXW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Southern California (SOCAL) Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Small Arms Ranges	Strike Warfare (STW)	●	There is a persistent requirement across all commands and warfare areas for personnel to train, and in certain instances qualify, on a spectrum of small arms, up to and including .50 caliber. Small Arms training is not captured specifically in the Navy Tactical Tasks or the RCD, but it is a training requirement for combat skills as well as security and force protection. Virtually every primary warfare area defined in the RCD requires annual small arms qualifications for a majority of personnel in each command. The OPNAV 3591.1F instruction only provides procedures and courses of fire for weapons normally operated by category I and II personnel. TYCOMs shall provide specific qualification and sustainment guidance for personnel designated as category III and IV; however, all those personnel designated category III and IV must abide by the basic qualification procedures contained within OPNAVINST 3591.1F. There are no Navy Region Southwest (NRSW) San Diego ranges to support OPNAVINST 3591.1F Category III (personnel who are issued weapons for combat support and expeditionary operations) and Category IV (personnel who are issued weapons for special missions, including ship's company force protection and VBSS personnel; explosive ordnance disposal teams in support of special operations forces; convoy support personnel; and other subsets of units supported by the SOCAL Range Training Complex) qualifications. Lack of Category III and IV small arms ranges reduces realism, inhibits new tactics development, and limits application of new weapon technologies. Fund and integrate into the range complex an appropriate number of comprehensive tactical small arms ranges at key training sites within the SOCAL Range Complex, with Field Calibrations Activity San Diego being the highest priority. Establish Memorandum of Understanding/Memorandum of Agreement (MOU/MOA) investments with other DoD installations where Navy personnel are required to train, particularly with heavy machine guns, to minimize impacts to personnel tempo due to scheduling priorities.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Strike Warfare (STW)	●	Training and testing activities within the SOCAL Range Complex compete with multiple airspace users, to include non-participating military aircraft, law enforcement (narcotics/human traffickers), commercial carriers, private aircraft, and NASA/commercial space interests. Existing airspace classifications may limit or prohibit training and testing events. This results in the creation of avoidance areas and/or regulatory limitations on type/time of training/testing event may restrict or prohibit certain operations, reduce range access, realism, tactics development, application of new technologies and/or increase cost or risk. The Navy will continue to engage with local air traffic control agencies, local flying clubs, fixed-base operators, FAA, Land use jurisdiction agencies, and elected officials to provide information on military training areas and operations. Continued engagement with users to determine need/requirements for potential change in airspace classification.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.

Southern California (SOCAL) Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Foreign Access or Control	Strike Warfare (STW)	●	Navy is concerned with foreign intelligence collection opportunities resulting from a persistent foreign presence proximate to Navy operations, testing, and training equities ashore and at-sea. As previously stated in the 2025 Air Test and Training Range Enhancement Plan, "An emerging challenge is the increasing presence of foreign business interests in the vicinity of our sensitive test and training ranges." Foreign acquisition of real estate in close proximity to Southern California Range Complex, a critical training and testing range, offers the ability to maintain a permanent presence near areas vital to Navy missions and national security, and facilitate an opportunity to collect critical information regarding national defense programs. Additionally, foreign investment to acquire U.S. businesses that operate near Navy activities is another avenue for establishing a permanent presence that presents very unique mission compatibility challenges. Navy actively engages in CFIUS, Fleet Commanders, Navy Region Commanders, and community planner to evaluate the security risks of foreign investment acquisitions in proximity to DoD equities. Although Navy considers this to be a potential encroachment threat for all testing and training ranges, the Navy's CFIUS Office (Proximity), in close coordination with the mission owners, has tracked and monitored foreign investment activities near the Southern California Range Complex and many other key ranges.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.
Land Use	Mine Warfare (MW)	●	Incompatible land use limits demolitions in open air demolition facilities; blank gunfire, and pyrotechnics. Public access to beaches adjacent to Navy training areas, as well as noise concerns express by adjacent communities, increases pressure to modify operations. Additionally, artificial light sources may interfere with night training and testing operations. These land use concerns create avoidance areas and/or regulatory limitations on type/time of training/testing event may restrict or prohibit certain operations, reduce range access, realism, tactics development, application of new technologies and/or increase cost or risk. The Navy will continue engagement with public stakeholders, land use jurisdiction agencies, and elected officials to provide information on military training areas and operations as well as use of REPI to help remove or avoid land use conflicts.
	Amphibious Warfare (AMW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Southern California (SOCAL) Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Maritime	Strike Warfare (STW)	●	Recreational boaters, commercial shipping, US/Mexico law enforcement activities (narcotics/human traffickers), and potential for offshore energy/blue technologies increase competition for air/sea space and potentially interfere with military training and testing. Additionally, regulatory requirements and established mitigation measures undertaken reduce training and testing capabilities. All at-sea training is impacted to some degree; impacts are most significant to integrated warfare training using active underwater acoustic sources or in-water explosive ordnance. Impacts result in the creation of avoidance areas and/or regulatory limitations on the type/time of training/testing events, and this may restrict or prohibit certain operations, reduce range access, realism, tactics development, application of new technologies, and/or result in increased cost or risk. The Navy will refine training and testing requirements, updated/execute actions under NEPA, and obtain appropriate permits or authorization needed to ensure military training and testing complies with applicable laws and regulations. The Navy will also continue work with NMFS in development of science based protective and mitigation measures that adequately protect marine species while accommodating military readiness activities, and factor mitigation effectiveness into permit requests and continues education of Fleet units to adhere to the maritime protective and mitigation measures and public education outreach efforts.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.
Other Regulatory Requirements	Strike Warfare (STW)	●	UXO munition restrictions and cultural resource concerns may effect/restrict location, type, and amount of training and testing. Operational Range Clearance (ORC) resources are necessary to systematically address historic use practices that limit ground and nearshore maneuver forces' access and negatively impact overall range sustainability. ORC does not include in-water sweep/clean-up requirements due to inherent explosives safety risks. Concerns include unsafe ocean water quality and State (direct/recommended) beach closures as a result of pollutants from the Tijuana Rivers. The presence of numerous Section 106 historic properties and compliance with the Native American Graves Protection and Repatriation Act may limit or restrict off-road vehicle, foot traffic, or ground-disturbing activities. All of these regulatory requirements create avoidance areas and/or regulatory limitations on type/time of training/testing event may restrict or prohibit certain operations, reduce range access, realism, tactics development, application of new technologies and/or increase cost or risk. The Navy will continue to refine training and testing requirements, participate in consultation efforts and conduct assessments of regulatory status. The Navy will also continue engagement with stakeholders, regulatory agencies, and elected officials to provide information on military training areas and operations.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.

Southern California (SOCAL) Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Range Transients	Strike Warfare (STW)	●	Training or testing events have been delayed or relocated to less than optimum locations as a result of range transients, involving commercial shipping, commercial fishing, and private pleasure boating. Range transients create avoidance areas and/or regulatory limitations on type/time of training/testing event may restrict or prohibit certain operations, reduce range access, realism, tactics development, application of new technologies and/or increase cost or risk. The Navy will continue to refine training and testing requirements, participate in consultation efforts, and conduct assessments of regulatory status. The Navy will continue engagement with stakeholders, regulatory agencies, and elected officials to provide information on military training areas and operations.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.
Spectrum	Strike Warfare (STW)	●	FCC sell-offs of frequencies traditionally used for military operations compresses available dedicated frequency spectrum; limiting use of existing equipment and requiring modification of systems. Employment of Link 16 is restricted and limitation of 120 frequencies for trunk radios within the SOCAL Range Complex is inadequate to support training and testing demands. Competition for frequency spectrum will add increased pressure on available bandwidth for Naval operations, to include future testing and unmanned system operations. Reduced availability of frequency spectrum limits existing fleet equipment, diverse operational systems returning to a training environment, and new systems in development by SPAWAR. Restrictions limit spectrum operations and prohibit certain training events that require combat and range support systems operating in encroached frequencies. The creation of avoidance areas and/or regulatory limitations on type/time of training/testing event may restrict or prohibit certain operations, reduce range access, realism, tactics development, application of new technologies, and/or result in increased cost or risk. SOCAL will seek DON Chief Information Officer and OSD support to avoid future reduction in capabilities (frequency sell offs) and to seek spectrum relief.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.

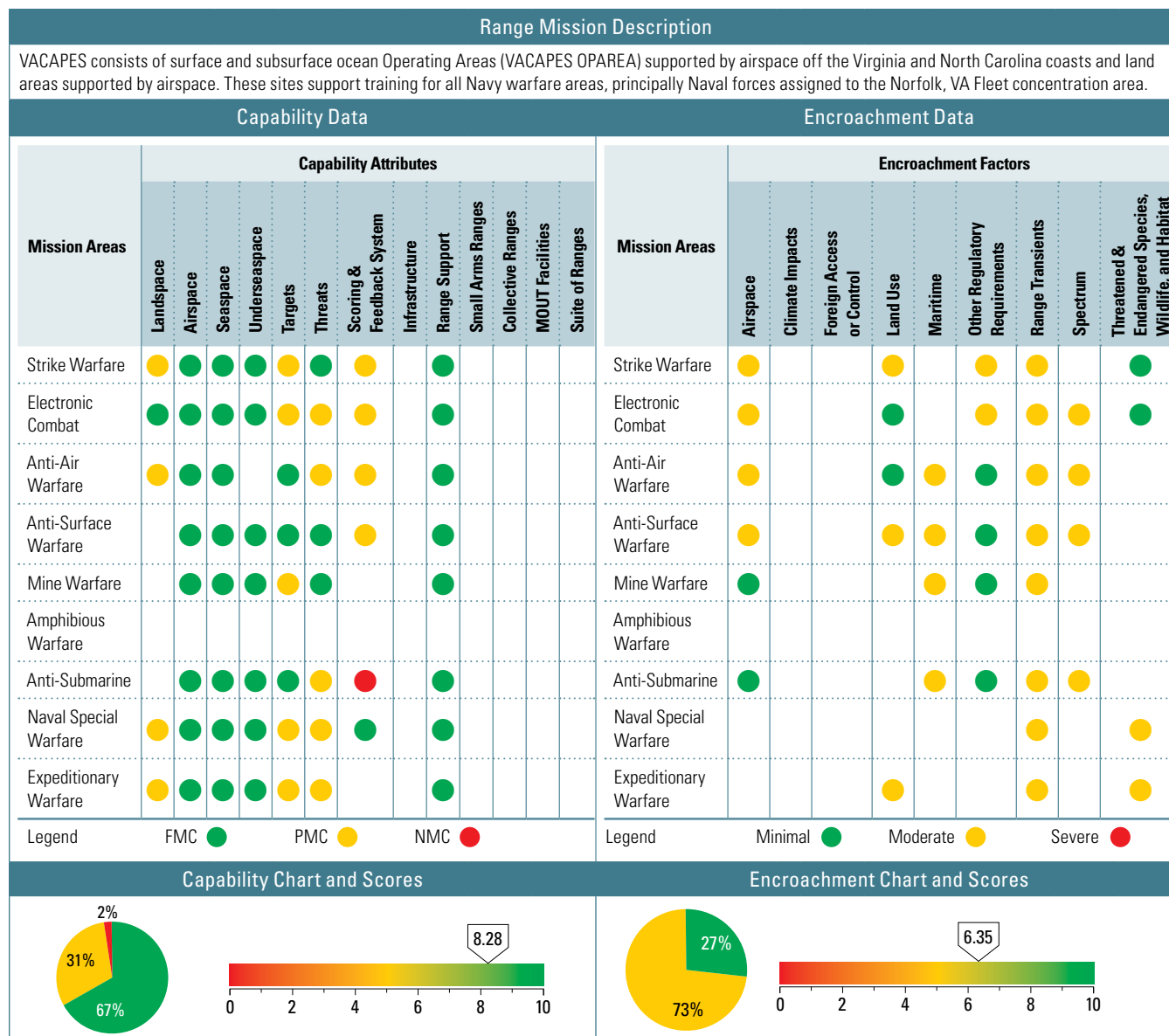
Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)**Southern California (SOCAL) Detailed Comments****Encroachment Observations**

Factors	Assigned Training Mission	Score	Comments
Threatened & Endangered Species, Wildlife, and Habitat	Strike Warfare (STW)	●	The presence of T&E species has potential to impact training and testing. Failure to comply with established regulations that impacts T&E species could jeopardize training and testing capabilities. Environmental conditions and factors have a threshold; a threshold that an increased training and/or testing operations tempo may exceed. Additionally, dense growth of cactus and exotic grasses prevent personnel from accessing target areas and clearing unexploded ordnance. Restriction on controlled burns limits the ability to address this. The creation of avoidance areas and/or regulatory limitations on the type/time of training/testing events may restrict or prohibit certain operations, reduce range access, realism, tactics development, application of new technologies and/or result in increased cost or risk. SOCAL will refine training and testing requirements, participate in consultation efforts and conduct assessments of regulatory status. Navy will continue engagement with stakeholders, regulatory agencies, and elected officials to provide information on military training areas and operations.
	Mine Warfare (MW)	●	Same as above.
	Amphibious Warfare (AMW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Regulatory restrictions and T&E species protection may effect military working dog activities. Military working dogs are required to meet specific kennel, working area, transport, and health certification requirements provided in SCIINST 5585.2. T&E species may be susceptible to disturbance, diseases, and/or parasites from dogs. This creates avoidance areas and/or regulatory limitations on the type/time of training/testing events, which may restrict or prohibit certain operations, reduce range access, realism, tactics development, application of new technologies and/or result in increased cost or risk. The Navy will continue to refine training and testing requirements, participate in consultation efforts, and conduct assessments of regulatory status. The Navy will also continue engagement with stakeholders, regulatory agencies, and elected officials to provide information on military training areas and operations.

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Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)

Virginia Capes (VACAPES) Assessment Details



Virginia Capes (VACAPES) Assessment Details

Summary Observations							Summary Observations						
The capability attribute most impacting range mission performance is Scoring & Feedback Systems. The mission areas most severely impacted are ASW and EC. There is no immediate change projected. The lack of flexibility to add land-based training space restricts Navy options to improve on-shore training capabilities. Shortfalls in training support capabilities are considered annually during POM cycles.							Spectrum, Maritime Sustainability, Airspace, and Range Transients are the encroachment areas that have the most pervasive training impacts. All Mission Areas have considerable encroachment. There are no prevailing or emerging mitigation strategies that will alter training encroachment for the foreseeable future. Most encroachment is long-standing and has been addressed through maritime mitigation measures and operations procedures.						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	7.39	7.50	7.50	7.67	7.65	7.70	Encroachment Scores	8.70	8.38	8.38	8.25	7.05	7.00
EC for Landspace was Yellow in 2008 and reassessed to Green in 2009, and forward, based on an updated assessment of Landspace requirement to the primary use of the range, which is for only the “basic” level training. The 2011 Red rating for MW Scoring & Feedback changed to White based on a USFF evaluation that TSPI scoring data is not required. The 2012 NSW mission assessment re-added to assessment file, as it is a primary mission area for the VACAPES range complex. The score increased in 2017 due to Range Support being graded as fully mission capable based on the use of a new web-based scheduling tool, DCAST. No further changes are anticipated.							Encroachment assessments for CY2008 were different than for CY2009–2015. The algorithm for the overall assessment score for 2009–2015 was revised from the original algorithm used in 2008 to provide greater fidelity and consistency across all range complexes. Based on an improved review process and revised algorithms, the assessments for CY2009–2015 provide a more accurate assessment of encroachment. The overall encroachment score for CY2017 dropped slightly from 2015 due to changes made in encroachment factors and definitions. The Northeast, Virginia Capes, and Chesapeake Bay Offshore EAP, including the VACAPES Range Complex, was completed November 2015. DOI and private energy interests, to include foreign investment and acquisition in the vicinity of the OCS, are increasing as domestic energy demand builds. Naval offshore operating areas and training events may be affected. High priority areas include training ranges and sea space in and adjacent to all Navy OPAREAs. OASN (EI&E) continues to work closely with the Fleets and DOI’s BOEM to resolve issues of combined use of the OCS important to both agencies. Fleet review and analysis of impacts from both oil/gas and wind energy “lease sale” areas have been reviewed and forwarded to OSD. DoD and DOI coordination continues. Maryland, Virginia, and North Carolina state and federal officials designated offshore wind areas for lease to developers of commercial scale offshore wind farms. Future wind farms may have the potential to affect military operations in the VACAPES Range Complex; however, good coordination among Federal and state task force representatives and DoD and Navy planners has and should limit any impact to maritime training. Recent federal executive action has removed a moratorium on Atlantic oil/gas development; this issue should remain in the Navy’s purview as the potential exists that it, along with other areas within the VACAPES Complex, may be considered for exploration and development. As mentioned previously, Mission Critical Areas have been identified and continued coordination with OSD and BOEM should help to mitigate impacts to Navy training and certification. Emerging encroachment issues that may impact VACAPES Range Complex training include establishment of OOS and acoustic sensors/ROVs; nomination, approval and/or expansion of NMS and National Monuments, either within or in the vicinity of surface and submarine training space and transit lanes (ex. Norfolk Canyon); power and telecommunications undersea cable distribution near sensitive training space; and designation of commercial shipping anchorage areas and sea lane expansion.						

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)**Virginia Capes (VACAPES) Detailed Comments**

Capability Observations			
Attributes	Assigned Training Mission	Score	Comments
Landspace	Strike Warfare (STW)	●	Landspace is only available at Dare County Bombing Range (NDCBR), which does not fully support size or topography requirements for placement of required number of targets. Use of live ordnance is not supported. Use of flares is restricted. No land area supports NSFS training or CSAR training. These shortfalls prohibit certain training events, reduce realism, and increase personnel optempo. No additional land options are available within VACAPES.
	Anti-Air Warfare (AAW)	●	Landspace is only available at NDCBR, which does not fully support size or topography requirements or support surface combatant detection of aircraft over land. Use of flares is restricted. These shortfalls prohibit certain training events, reduce realism, and increase personnel optempo. Overland Carrier Air Wing ACM training is conducted at Fallon Range Training Complex.
	Naval Special Warfare (NSW)	●	Landspace is only available at JEB Little Creek-Fort Story, NAS Oceana Detachment Dam Neck, and NDCBR, which do not fully support live fire and maneuver and MOUT requirements. This prohibits certain training events, reduces realism, limits application of new weapon systems, reduces live fire proficiency, increases personnel tempo, and increases O&M costs. No additional Navy-owned land options are available within VACAPES. Other Service land areas are used to supplement land area requirements.
	Expeditionary Warfare (EXW)	●	Same as above.
Targets	Strike Warfare (STW)	●	Live ordnance is not allowed, the urban area is too small, NSFS is not supported ashore, and required targets do not provide both visual and infrared signatures. These shortfalls prohibit certain training events, reduce realism, limit application of weapon technologies, reduce live fire proficiency, increase personnel optempo, and increase O&M costs.
	Electronic Combat (EC)	●	Additional targets are required to achieve required density and a more representative threat. Range restrictions limit certain training events, reduces realism, limits application of weapon technologies, reduces live fire proficiency, increases personnel optempo, and increases O&M costs.
	Mine Warfare (MW)	●	There are insufficient training mines and range areas to support increased MW training. VACAPES must support the Navy's principal MH-60 and MH-53 MW helicopter squadrons. This prohibits certain training events, reduces realism, inhibits tactics, increases personnel optempo, and increases O&M costs.
	Naval Special Warfare (NSW)	●	Existing VACAPES beach landspace does not support placement of obstacles and defenses that support employment of HE ordnance clearing devices. This prohibits certain training events, reduces realism, limits application of new weapons, reduces live fire proficiency, increases personnel tempo, and increases O&M costs.
	Expeditionary Warfare (EXW)	●	Same as above.
Threats	Electronic Combat (EC)	●	The EC threat representation does not fully support EC threat levels 3 or 4 for required mission areas. The existing instrumentation systems are becoming obsolete and unsupportable through the FYDP. This reduces realism; inhibits tactics development; and greatly increases O&M costs. The Navy recommends maintaining the current upgrade schedule to preclude severe degradation of system capability. No completion date has been identified.
	Anti-Air Warfare (AAW)	●	Helicopter threat OPFOR is not available; required number of air threat OPFOR is not available; there is no dedicated supersonic threat OPFOR available. This reduces realism; inhibits tactics, increases personnel optempo, and increases O&M costs. The Navy recommends increasing the number and types of air threat OPFOR. No completion date has been identified.
	Anti-Submarine (ASW)	●	There are limited dedicated live submarines, surface ships, or aircraft to serve in the OPFOR role. This prohibits certain training events; reduces realism; inhibits tactics; increases personnel optempo; and increases O&M costs. The Navy recommends investing in additional threat OPFOR and increasing the availability of submarines through the DESI and aircraft through CAS. No completion date has been identified.
	Naval Special Warfare (NSW)	●	Dedicated ground, armor, and mechanized vehicle OPFORs are not available. This prohibits certain training events, reduces realism, limits application of new weapons, reduces live fire proficiency, increases personnel tempo, and increases O&M costs. The Navy will investigate other locations that will support the required OPFOR and work with other forces for mutual support of training requirements. No completion date has been identified.
	Expeditionary Warfare (EXW)	●	Same as above.

Virginia Capes (VACAPES) Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Scoring & Feedback System	Strike Warfare (STW)	●	The OPAREA coverage is not complete, due to line of sight issues with the Fleet operating over the horizon. M&S is inadequate, and there is no RTKN. TCTS II is the POR that will deliver M&S to aircraft. This reduces realism, inhibits tactics, increases personnel optempo, and increases O&M costs.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	There is no underwater tracking range, scoring capability, M&S, or post mission feedback. This prohibits certain training events, reduces realism, limits weapon technologies, inhibits tactics, reduces live fire proficiency, increases personnel optempo, and O&M costs. A VACAPES based underwater tracking range would enable higher quality basic level training and limited integrated level training.
	Anti-Submarine (ASW)	●	There is no underwater tracking range, scoring capability, M&S, or post mission feedback. This prohibits certain training events, reduces realism, limits weapon technologies, inhibits tactics, reduces live fire proficiency, increases personnel optempo, and O&M costs.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Airspace	Strike Warfare (STW)	●	The FAA is under pressure to use VACAPES and Northeast SUA in a manner favorable to commercial aviation. FAA may become more averse to Navy SUA control protocols. Tourist banner towing aircraft and fish spotting aircraft at times intrude upon Dam Neck special SUA. These activities create avoidance areas, reduces usage days, prohibits certain training events, reduces range access, segments training/reduces realism, inhibits new tactics development, and increases costs and risks. Navy/FAA protocols should be revisited given commercial aviation's increasingly frequent intervention into airspace use and control priorities, e.g. processes involved with updates and changes regarding MTRs, MOAs, LOAs, and Mission Critical Areas.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
Land Use	Strike Warfare (STW)	●	There are potential Safety Zone Issues with regard to communities underlying Navy Dare County Bombing Range (NDCBR) and Long Shoal Naval Ordnance Area (LSNOA) SUA. The NDCBR Compatibility Zones extend over large areas of Dare and Tyrrell Counties, and some existing and future land uses in these zones are incompatible. The LSNOA Compatibility Zones extend over large areas of the Pamlico Sound and perimeter villages and some existing and future land uses in these zones are incompatible. This encroachment creates avoidance areas, restricts flight altitudes and/or airspeeds, inhibits new tactics development. The Navy will work with Dare County to incorporate the RAICUZ recommendations into Dare County land use planning initiatives, continue the DBRAC meetings, and support compatible land use such as farmland preservation.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.

Figure 3-27 Navy Capability and Encroachment Assessment Detail (continued)**Virginia Capes (VACAPES) Detailed Comments****Encroachment Observations**

Factors	Assigned Training Mission	Score	Comment
Maritime	Anti-Air Warfare (AAW)	●	Maritime protective and mitigation measures undertaken in compliance with regulatory requirements have resulted in training restrictions that reduce training flexibility and ultimately reduce training realism. All at-sea training is impacted to some degree; impacts are most significant to integrated warfare training using active underwater acoustic sources. The Navy and NMFS have developed science based protective and mitigation measures that adequately protect marine species while accommodating military readiness activities. The Navy continues to develop Environmental Impact Statements and obtain permits and authorizations for its range complexes to ensure military training complies with applicable laws and regulations. Litigation risks remain a concern, entailing the potential to delay or further restrict training, despite the protective and mitigation measures applied by the Navy in compliance with the MMPA and ESA. Endangered species/critical habitat encroachment from the North Atlantic right whale has created avoidance areas that have resulted in some reduction of training days and prohibits certain training events. This area is relatively small in scope; however, if these types of restrictions were applied to other species/areas, there would be significant impacts to readiness through reduction in range access, segmentation of training/reduction in realism, limits on the application of new technologies, raised flight altitudes, reduced live fire proficiency, increased personnel tempo, and increased O&M costs. The Navy will continue to invest in marine mammal research; rely on scientifically valid empirical data results as basis of marine mammal mitigation development; factor mitigation effectiveness into permit requests; and continue education of Fleet units to adhere to the maritime protective and mitigation measures and public education outreach efforts. Navy's authorizations under the MMPA and ESA include an adaptive management approach that includes continually evaluating existing mitigation measures for their potential impacts on training. If impacts on training from mitigation measures are identified and documented, Navy will raise these impacts with NMFS for resolution during an annual adaptive management review process.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
Other Regulatory Requirements	Strike Warfare (STW)	●	Self-imposed Clean Water Act/Dare County wetlands and land use plans limit target configuration, placement, and maintenance due to many NDCBR impact areas having been situated in designated wetlands. This Navy induced encroachment affects STW by limiting targetry opportunities at NDCBR. Wetlands encroachment creates avoidance areas. Consideration should be given to seeking out a wetlands delineation at NDCBR and to seek wetlands 404 permits to accommodate target configuration, placement, and maintenance. The Navy will assess emerging demands for upgraded or additional impact areas within or out of the wetland areas to accommodate new munitions technologies.
	Electronic Combat (EC)	●	Same as above.
Range Transients	Strike Warfare (STW)	●	Range transients, involving commercial shipping, commercial fishing, and private pleasure boating encroach on training, either by delaying events or forcing relocation to less than optimum locations. Commercial vessel and recreational vessel encroachment create avoidance areas and segments training/reduces realism. Impacts operations and test at Navy Shipboard Electronic Systems Evaluation Facility offshore VACAPES. The Navy will continue to pursue opportunities to inform industry and the public of the impact of range transient encroachment on at sea OPAREAS and Navy readiness.
	Electronic Combat (EC)	●	Same as above.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Mine Warfare (MW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
	Naval Special Warfare (NSW)	●	Same as above.
	Expeditionary Warfare (EXW)	●	Same as above.

Virginia Capes (VACAPES) Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Spectrum	Electronic Combat (EC)	●	Employment of Link 16, SPY-1 radar, SPS 49 radar, and IFF are restricted. These restrictions limit spectrum operations and prohibit certain training events, segment training/reduce realism, reduce training days, limit application of new weapons technologies, and inhibit new tactics development. The Navy continues to coordinate with appropriate frequency allocation and oversight agencies to seek spectrum relief and to develop encroachment strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies. Competition for frequency spectrum will add increased pressure on available bandwidth for Naval operations.
	Anti-Air Warfare (AAW)	●	Same as above.
	Anti-Surface Warfare (ASUW)	●	Same as above.
	Anti-Submarine (ASW)	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Naval Special Warfare (NSW)	●	Sea turtles and marine mammals can be found in the waters offshore from NAS Oceana Dam Neck Annex. Sea turtles use the Dam Neck beach for nesting purposes. Threatened and endangered marine mammal species may migrate through the littoral waters offshore. Both of these conditions result in potential training impacts for Naval Special Warfare Development Group. Training activities affected are NSW OPS; Over-the-Beach; and Marksmanship. The Navy will continue Fleet unit education on adherence to marine species protective measures.
	Expeditionary Warfare (EXW)	●	Sea turtles and marine mammals can be found in the waters offshore from NAS Oceana Dam Neck Annex. Sea turtles use the Dam Neck beach for nesting purposes. Threatened and endangered marine mammal species may migrate through the littoral waters offshore. Both of these conditions result in potential training impacts for NECC EOD forces. Training activities affected are EOD and CRF OPS; Over-the-Beach; Marksmanship, and Explosives and small craft. The Navy will continue Fleet unit education on adherence to marine species protective measures.

Table 3-9 Navy Range Capability and Encroachment Assessment Comparison

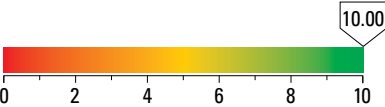
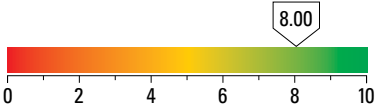
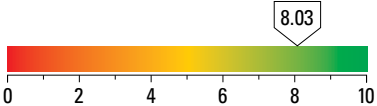
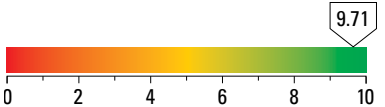
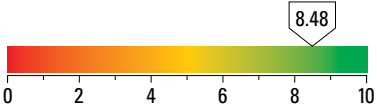
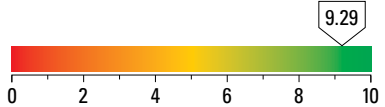
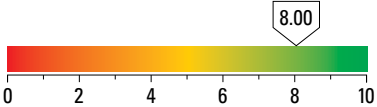
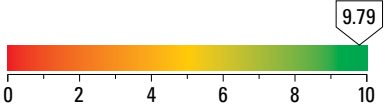
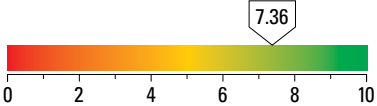
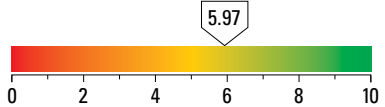
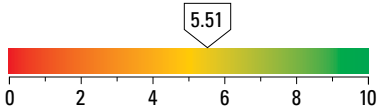
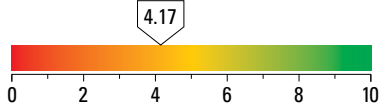
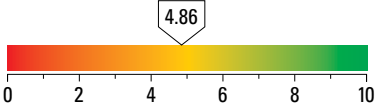
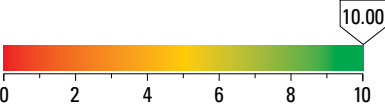
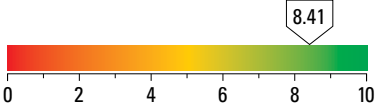
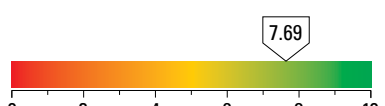
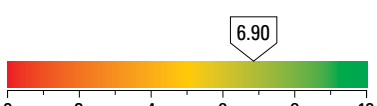


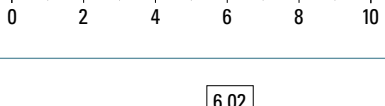
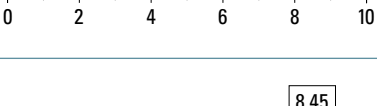
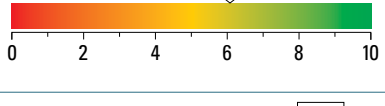
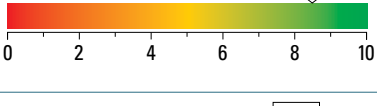
Range Name	Capability Score	Encroachment Score
Atlantic City	 10.00	 8.00
Atlantic Test Ranges	Not Assessed	 8.03
AUTEC	 9.71	 8.48
Boston	 9.29	 8.00
China Lake	 9.79	 7.36
El Centro	 5.97	 5.51
Fallon Training Range Complex	 4.17	 4.86
Gulf of Mexico	 10.00	 8.41
Hawaii	 7.69	 6.90
Jacksonville	 8.33	 7.10
Japan	 6.02	 8.45
Key West	 8.57	 8.00

Table 3-9 Navy Range Capability and Encroachment Assessment Comparison (continued)

Range Name	Capability Score	Encroachment Score
Mariana Islands		
Narragansett Bay		
Navy Cherry Point		
NOCAL		
Northwest Training Range Complex		
Okinawa		
Point Mugu Sea Range		
SOCAL		
VACAPES		

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3.2.4 Air Force Range Assessments

Table 3-10 Air Force Capability Assessment Data Summary

Range	NMC	PMC	FMC	Capability Scores
Adirondack	0	12	65	9.22
Airburst	0	10	67	9.35
Atterbury	0	2	38	9.75
Avon Park	0	15	52	8.88
BMGR	0	10	51	9.18
Blair Lake	0	16	38	8.52
Bollen	0	12	65	9.22
Cannon	0	0	42	10.00
Claiborne	0	5	57	9.60
Dare County	0	6	66	9.58
Draughon	0	20	26	7.83
Edwards Flight Test Range (EFTR)	0	15	87	9.26
Eglin Test & Training Complex (ETTC)	4	31	53	7.78
Falcon	0	7	66	9.52
Grand Bay	0	2	67	9.86
Grayling	0	6	83	9.66
Hardwood	0	2	60	9.84
Holloman	0	19	21	7.63
Jefferson	0	12	76	9.32
McMullen	0	31	37	7.72
Melrose	0	5	49	9.54
Mountain Home Ranges	0	6	99	9.71
NTTR	4	12	67	8.80
Poinsett	0	6	29	9.14
Polygone	0	12	16	7.86
Razorback	0	2	75	9.87
Shelby	0	5	94	9.75
Smoky Hill	0	22	52	8.51
UTTR	2	10	85	9.28
Warren Grove	0	16	65	9.01
HQ AF	10	329	1748	9.16

Table 3-11 Air Force Encroachment Assessment Data Summary

Range	Severe	Moderate	Minimal	Encroachment Scores
Adirondack	0	8	62	9.43
Airburst	0	0	56	10.00
Atterbury	0	1	38	9.87
Avon Park	0	4	60	9.69
BMGR	0	9	46	9.18
Blair Lake	0	8	39	9.15
Bollen	0	11	53	9.14
Cannon	0	0	40	10.00
Claiborne	0	3	46	9.69
Dare County	0	1	63	9.92
Draughon	2	22	13	6.49
Edwards Flight Test Range (EFTR)	0	5	23	9.11
Eglin Test & Training Complex (ETTC)	0	42	53	7.79
Falcon	0	6	49	9.45
Grand Bay	0	4	33	9.46
Grayling	0	9	63	9.38
Hardwood	0	2	70	9.86
Holloman	0	12	23	8.29
Jefferson	0	12	51	9.05
McMullen	0	13	51	8.98
Melrose	0	2	70	9.86
Mountain Home Ranges	0	8	72	9.50
NTTR	1	17	62	8.81
Poinsett	0	5	25	9.17
Polygone	0	5	17	8.86
Razorback	0	2	70	9.86
Shelby	0	3	77	9.81
Smoky Hill	0	1	63	9.92
UTTR	0	4	68	9.72
Warren Grove	0	3	78	9.81
HQ AF	3	222	1534	9.35

All 30 locations listed in the Air Force's range inventory in Appendix A have a corresponding range assessment. While the Air Force does have additional locations that it considers ranges, such as electronic warfare sites, these locations were not assessed as part of this report and were not included in the inventory due to the types of operations they support.

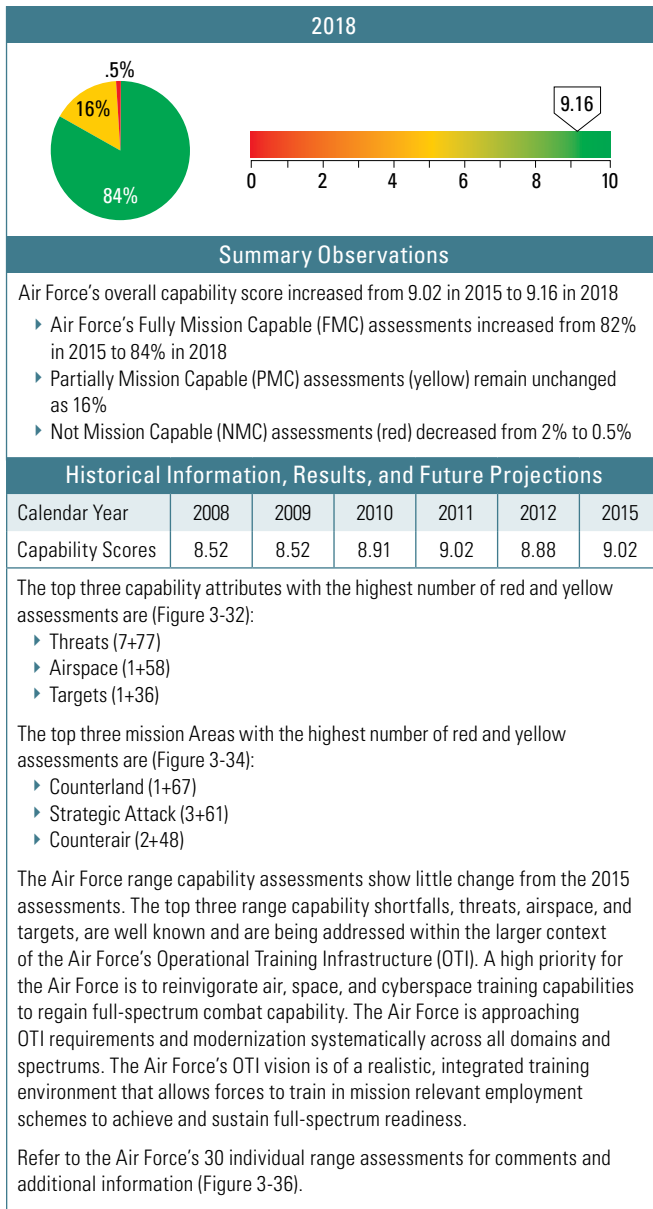
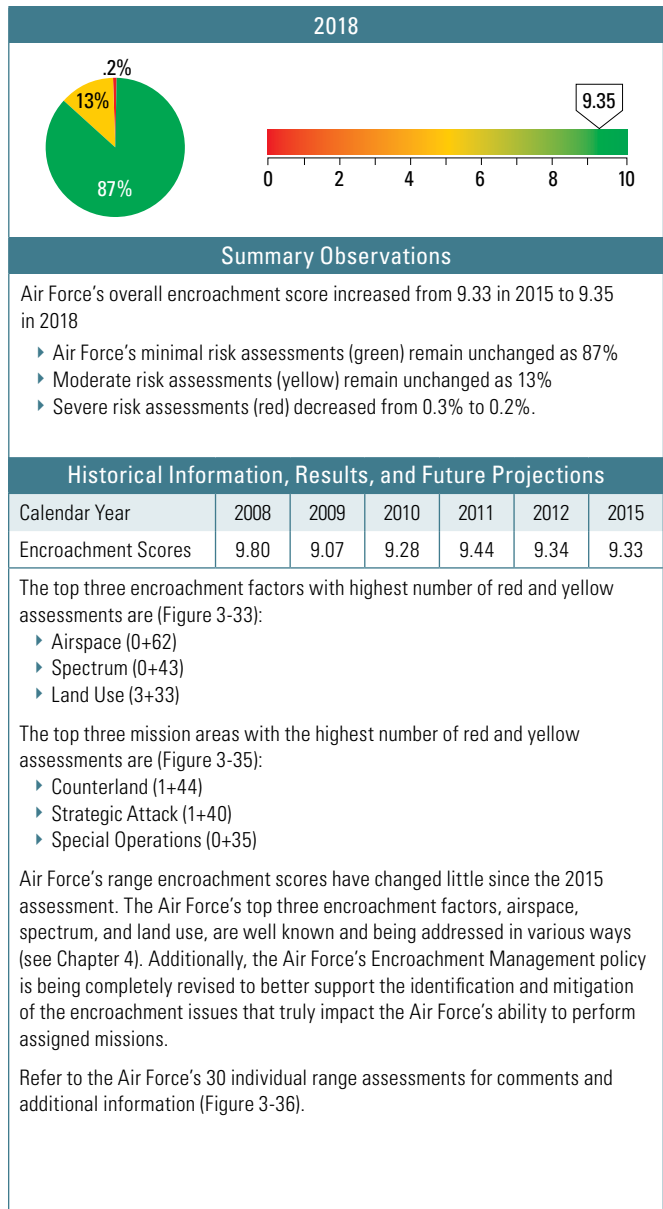
Figure 3-28 Air Force Capability Chart and Scores**Figure 3-29** Air Force Encroachment Chart and Scores

Figure 3-30 Air Force Capability Assessments by Range

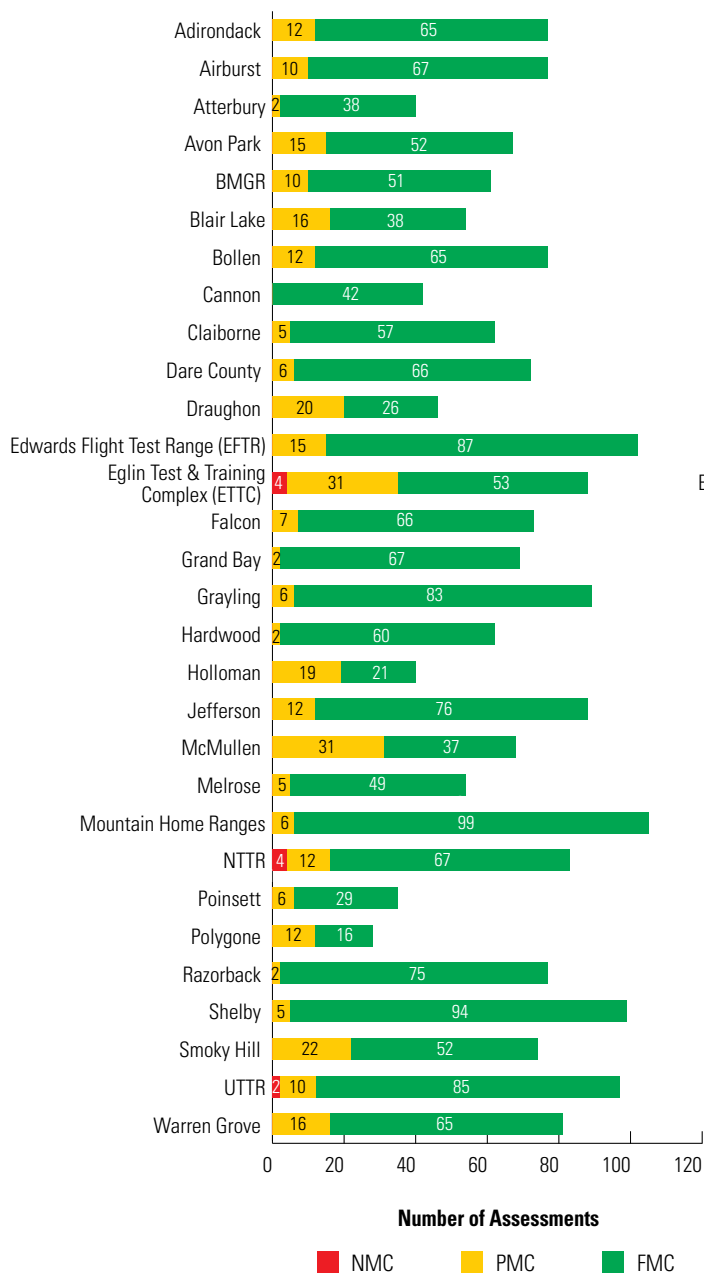


Figure 3-31 Air Force Encroachment Assessments by Range

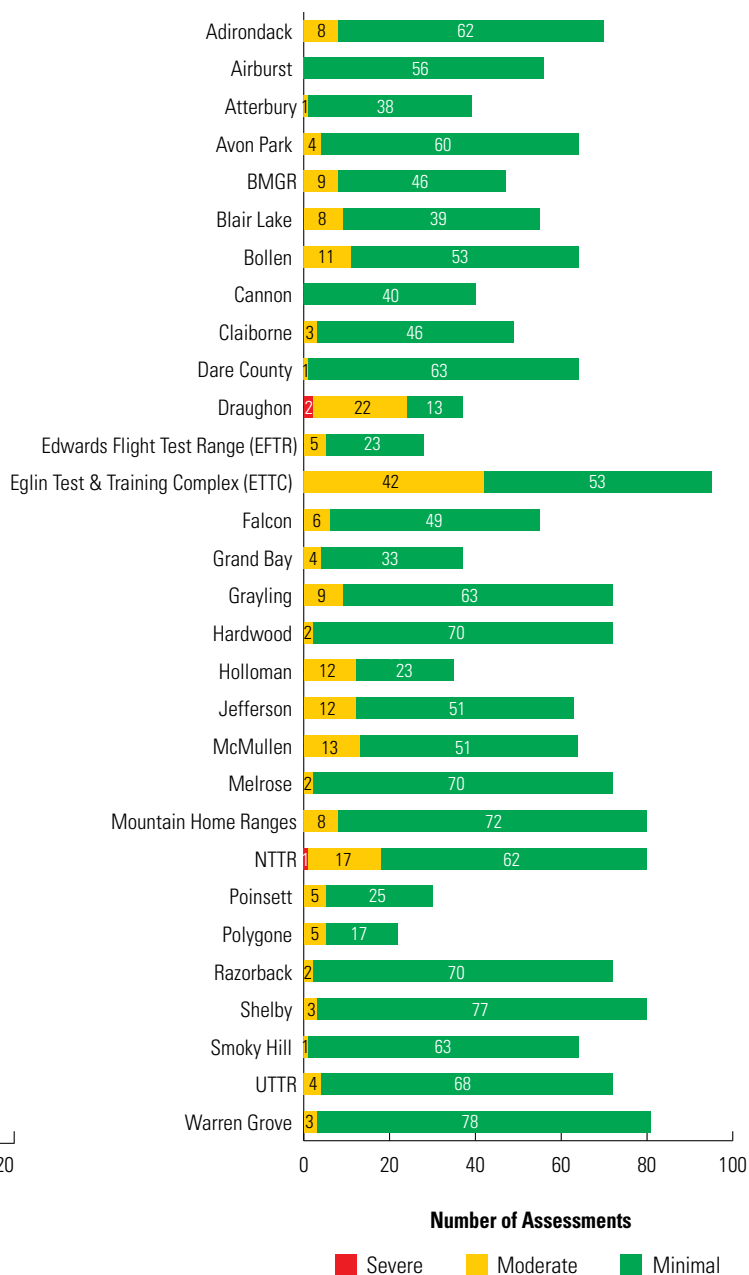


Figure 3-32 Air Force Capability Assessment by Attributes

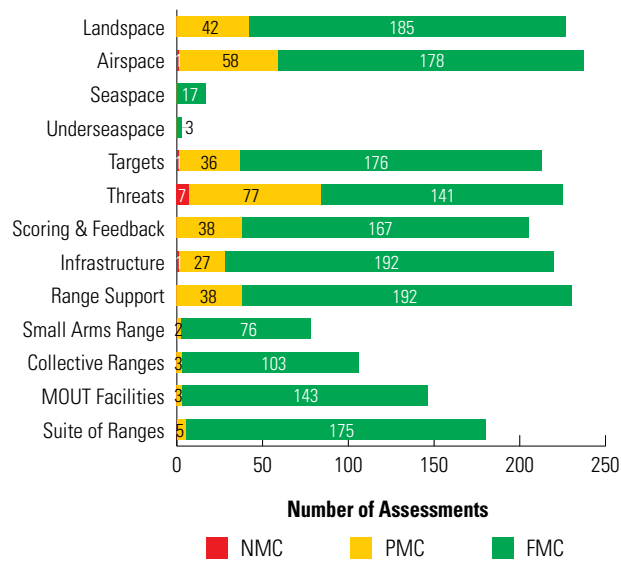


Figure 3-33 Air Force Encroachment Assessment by Factors

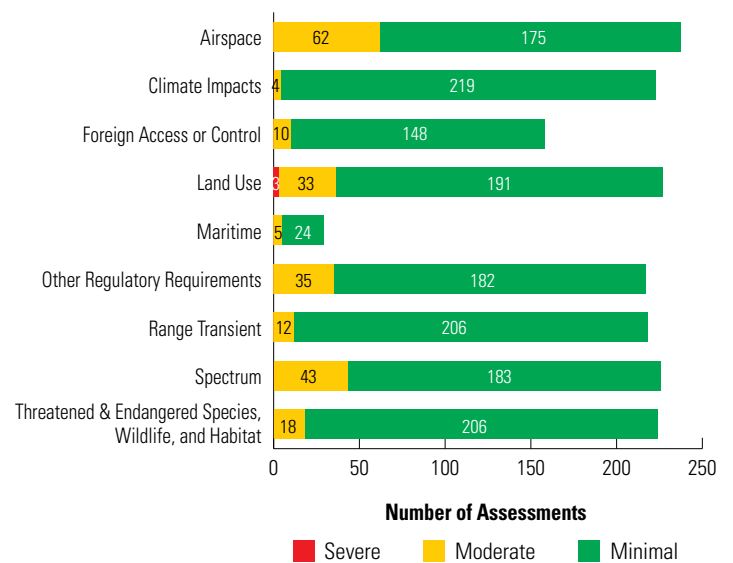


Figure 3-34 Air Force Capability Assessment by Mission Areas

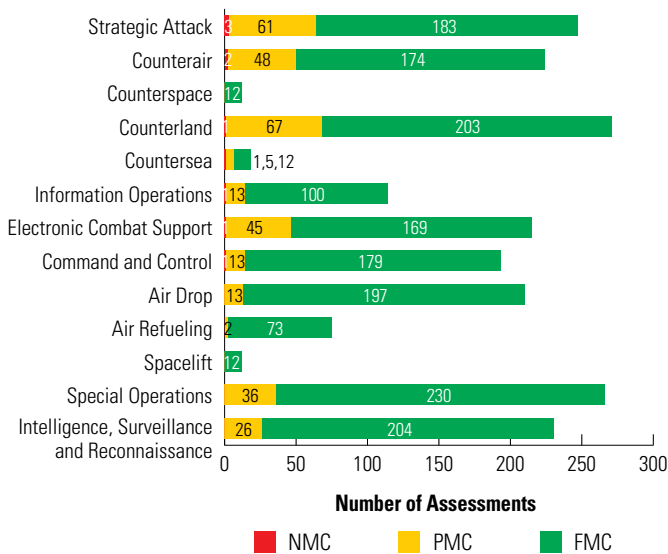


Figure 3-35 Air Force Encroachment Assessment by Mission Areas

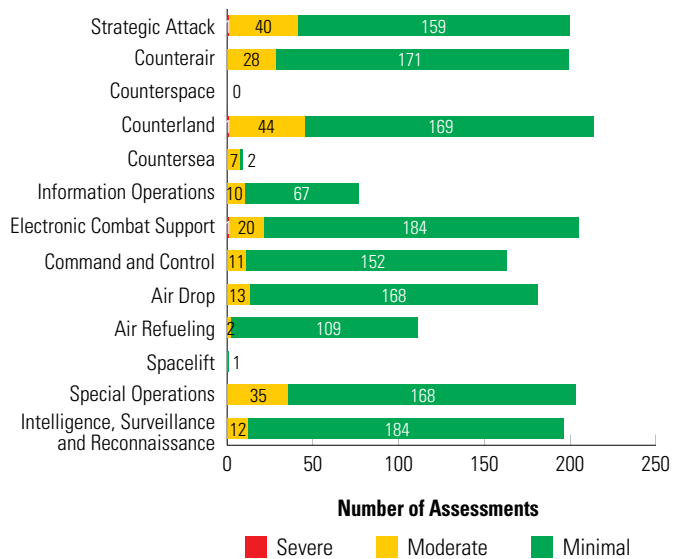
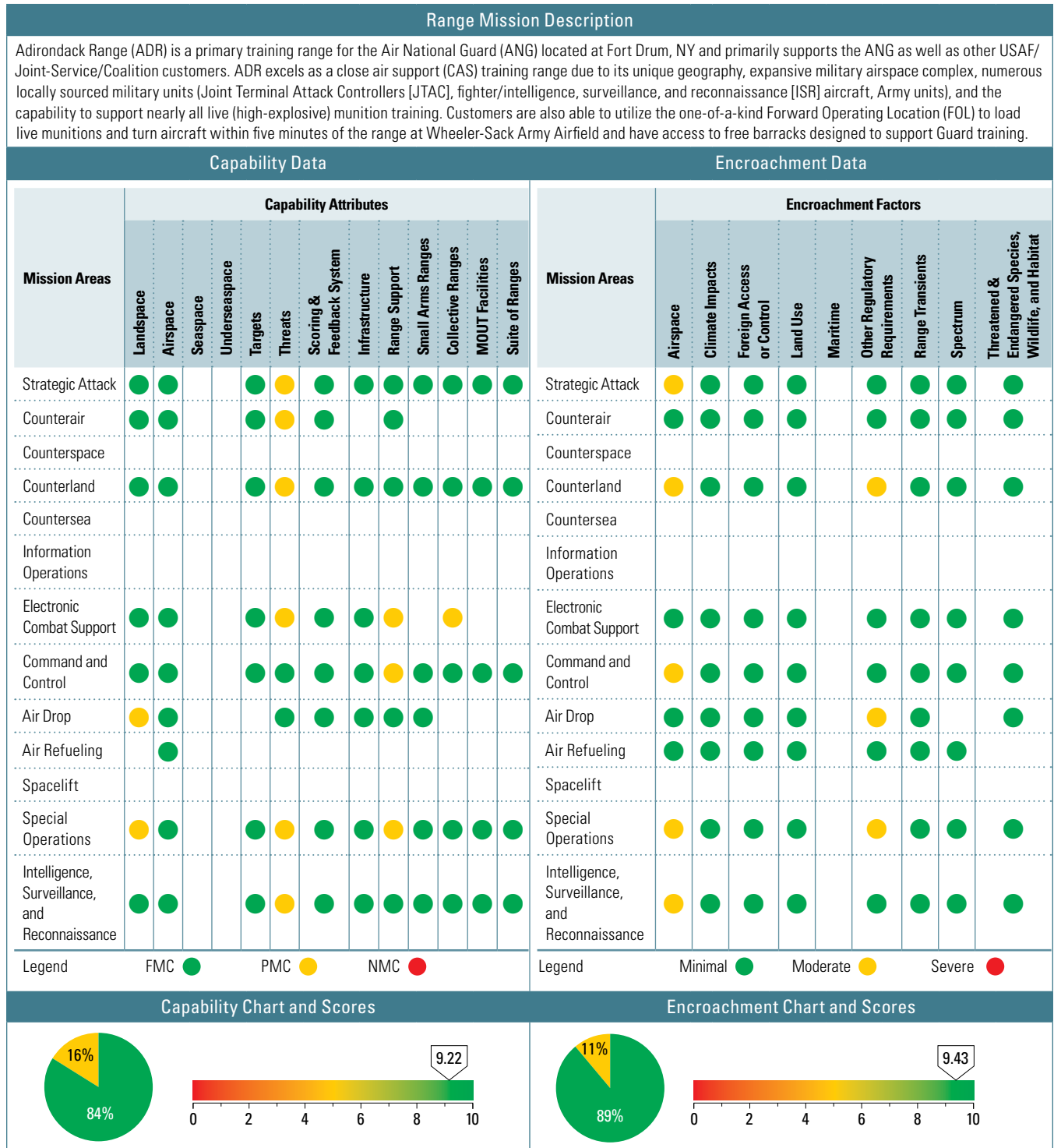


Figure 3-36 Air Force Capability and Encroachment Assessment Detail

Adirondack Assessment Details



Adirondack Assessment Details

Summary Observations							Summary Observations						
Adirondack Range has a robust capability to support a wide range of training requirements due to its access to over 75,000 acres of impact area for WDZ containment as well as direct access to 4,500 square miles of special use airspace (SUA). One capability gap is the lack of a modern threat emitter and Link-16 infrastructure.							Shared joint use of the range land and airspace at Fort Drum occasionally creates a need to deconflict activity for safety reasons. This is taken care of during weekly training resource meetings and through negotiating training priorities in regulating documents.						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	7.77	7.77	N/A	7.27	7.27	7.80	Encroachment Scores	8.96	8.96	N/A	8.94	8.94	8.98
Adirondack Range's score is improving due to an increase in access of range land/target areas based on reliable and sustainable EOD support. Some other information was corrected or updated due to improved capabilities based on a newly negotiated Inter-Service Support Agreement (ISSA) with the host base (Fort Drum).							Adirondack Range's score has shown slight improvement due to an increased access and cooperation from the Natural Resources department and Explosive Ordnance Disposal (EOD) support to gain more access to range land for target/training improvements. Deconfliction with training from adjacent Army ranges continues to be a notable issue; however, a recently negotiated memorandum of agreement (MOA) with the host base agency provides more accountability for deconfliction and setting priorities to ensure continued ANG/USAF training at ADR.						

Adirondack Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landscape	Air Drop	●	Portions of the range are categorized as "impact areas" and require a risk assessment prior to accessing the land.
	Special Operations	●	Same as above.
Threats	Strategic Attack	●	The Radar Warning Receiver (RWR) Lite system is limited to line-of-sight and is programmed for only a few threats, it provides a minimal level of training and cannot support 5th generation training requirements. The previously operational wide-band threat emitter (WRETS) is no longer supported and obsolete.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance and Reconnaissance	●	Same as above.
Range Support	Electronic Combat Support	●	Same as above.
	Command and Control	●	Same as above.
	Special Operations	●	Same as above.
Collective Ranges	Electronic Combat Support	●	Same as above.

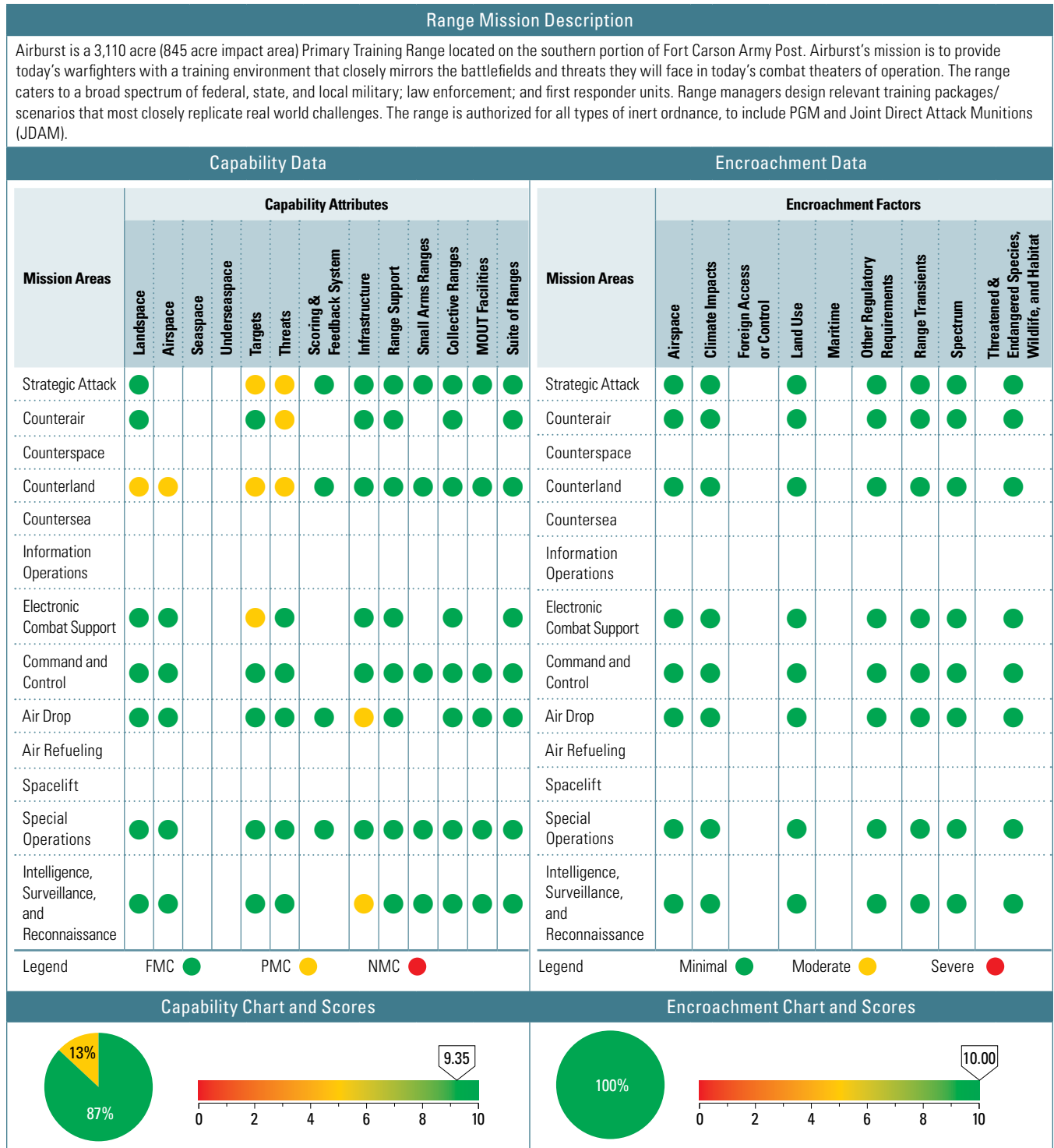
Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)**Adirondack Detailed Comments**

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Airspace	Strategic Attack	●	Unmanned Aerial System (UAS) activity, Safety Danger Zones created by live fire operations, and concurrent use of other ranges on Fort Drum Training Areas create restrictions on any given day in the R5201 restricted airspace.
	Counterland	●	Same as above.
	Command and Control	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance and Reconnaissance	●	Same as above.
Other Regulatory Requirements	Counterland	●	A significant portion of Adirondack Range consists of wetlands which restrict training that requires land maneuver.
	Air Drop	●	Same as above.
	Special Operations	●	Same as above.

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Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Airburst Range Assessment Details



Airburst Range Assessment Details

Summary Observations							Summary Observations						
A vast majority of areas rated yellow can be attributed to the range's inability to provide a realistic and relevant training environment due to insufficient land area, airspace, funding, and target sets. The range performs very well at Close Air Support, Basic Surface Attack, and Air Drops. Training suffers in terms of realism and relevance when the mission dictates large ground forces, enhanced threats and large force exercises. In the coming years, Airburst Range will continue to operate as it does currently, maximizing available assets and personnel while working with the 140th Wing Airspace Manager and the Federal Aviation Administration (FAA) to modify the existing airspace to better accommodate realistic and relevant training.							Airspace volume and attributes limit tactics and ordnance delivery options as well as prevent the integration of bomber units in close air support (CAS) scenarios during unit exercises/full mission profiles. Virtually all attacks with PGMs or JDAMs are limited to a single attack run-in heading. Additionally, the lack of a high altitude connection between the La Veta Military Operations Area (MOA) and Airburst Alpha MOA prevents a smooth transition for surface attack missions fighting their way into Airburst Range. While these concerns do not prevent training, Airburst's training environment would be greatly enhanced with the addition of a high altitude connection between the two MOAs. The 140th Wing Airspace Manager is currently developing a proposal to address these concerns.						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	8.28	8.28	10.00	8.90	8.90	9.42	Encroachment Scores	8.86	8.86	10.00	10.00	10.00	10.00
ANG has implemented a capabilities sharing program for threat emitters to support scheduled exercises and training rotations. ANG Force Structure is projected to be relatively stable throughout the FYDP.							In the near term, encroachment scores are not expected to change. However, in the long term it is slightly possible that encroachment will increase due to the development of residential areas west of Pueblo West Colorado and east of Penrose Colorado. Currently, the land due south of Airburst is privately owned and under contract with Fort Carson to prevent encroachment. The scope and timeline of this non-development contract is unknown as it is between the US Army and the land owner. Development within the Alpha and Bravo MOAs is a nonfactor.						

Airburst Detailed Comments

Capability Observations

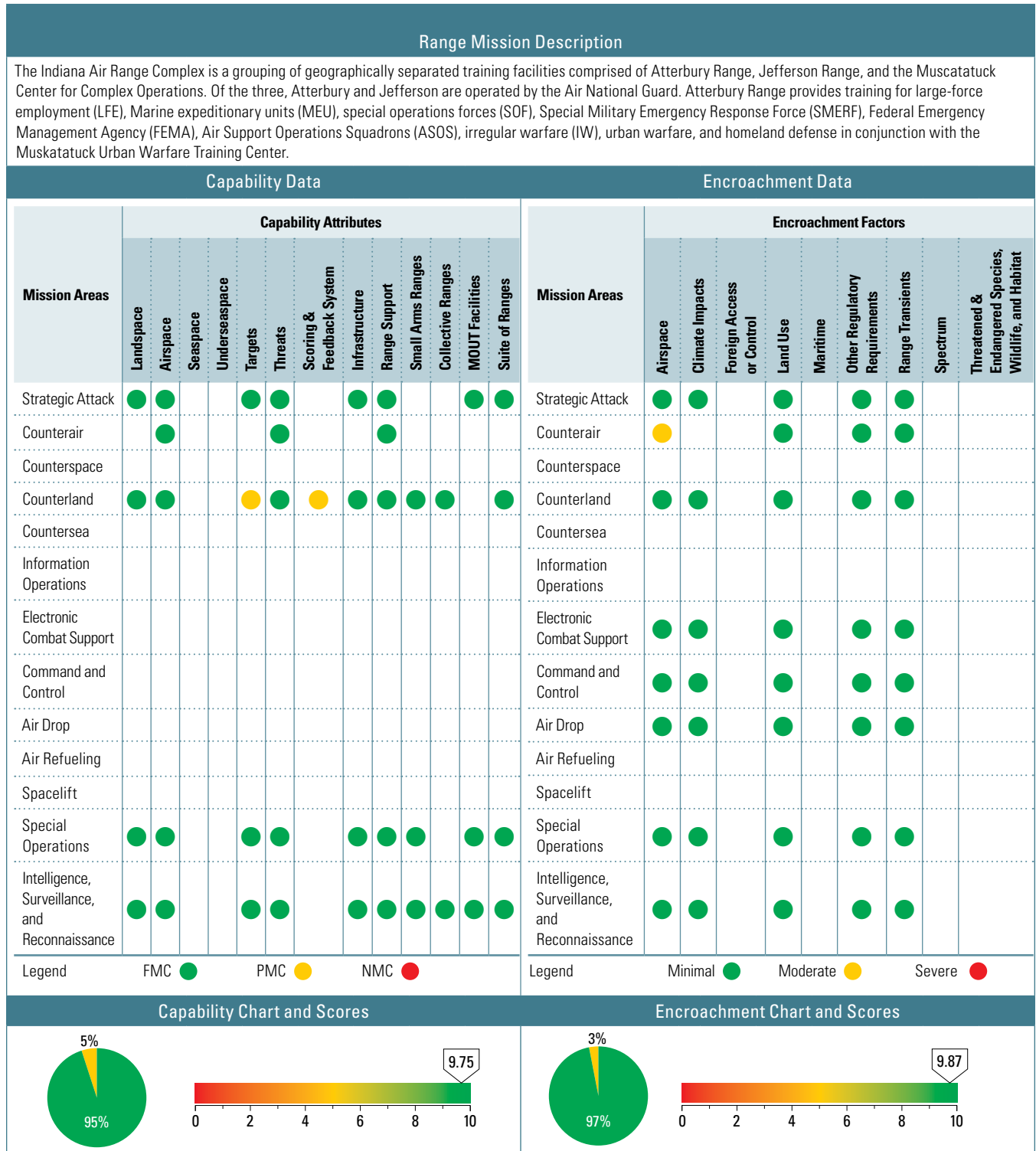
Attributes	Assigned Training Mission	Score	Comments
Landspace	Counterland	●	Limited land area does not allow for the construction of a realistic urban CAS village. Training is impacted due to the limited number of targets and associated scenarios. Airburst will continue to build the best urban CAS village within current land constraints.
Airspace	Counterland	●	Volume and attributes of airspace limits tactics and ordnance. Virtually all attack runs with PGMs or JDAM are limited to one direction. Working to expand airspace via Colorado Airspace Initiative.
Targets	Strategic Attack	●	The range provides some but not all target types for strategic attack (e.g., real building/complexes vice stacked conex containers).
	Counterland	●	Range target suite provides some but not all target types possible for CAS and MOUT operations. Limited realism and training due to urban area made of stacked conex containers.
	Electronic Combat Support	●	Same as above.
Threats	Strategic Attack	●	Limited capability to replicate tactical surface-to-air threats. Current Radar Warning Receiver (RWR) threat simulator has a very limited range and a limited selection of threat frequencies.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
Infrastructure	Air Drop	●	Lack of Situation Awareness Data Link (SADL) and Link-16 capabilities. Currently working with 140th WG Communications to procure and set up the infrastructure needed to support these capabilities.
	Intelligence, Surveillance, and Reconnaissance	●	There is no small paved runway available for small intelligence, surveillance, and reconnaissance (ISR) platforms that require a prepared or hard surface. As a workaround, units can use the Red Devil airstrip to the north of Airburst.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
No comments.			

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Atterbury Assessment Details



Atterbury Assessment Details

Summary Observations							Summary Observations						
Five percent of the range's mission areas are only partially mission capable (PMC). The MOUT facilities and activities on other ranges still impact the range's capability to support Intelligence, Surveillance, and Reconnaissance; Special Operations; and Strategic Attack to the extent it is requested. The Air Force has been able to integrate these operations into larger Combined Arms Live Fire Exercise events and exercises with other ANG and DoD users as scheduling allows. The capability to increase capacity to support training in these areas is possible through coordination and use of IARC.							Atterbury Range's training missions are moderately impacted by encroachment factors; however, these factors are internal and are being mitigated through scheduling and long-range programming. Adjacent land use restricts the range's ability to support counterair training due to airspace constraints.						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	8.98	8.98	8.98	9.29	9.29	9.65	Encroachment Scores	8.23	8.23	8.23	8.23	8.23	8.43
Overall capabilities at the range complex have increased through coordination between the two available impact areas in the state. Additional coordination with Army range control personnel has provided increased capability for joint and combined live fire exercises. The range complex infrastructure has expanded and become more robust, allowing for greater training capability.							Encroachment issues at Atterbury Range have been stable over the years and are not projected to change significantly in the near future. Proactive management by the range has resulted in significant reduction in encroachment impacts on training.						

Atterbury Detailed Comments

Capability Observations

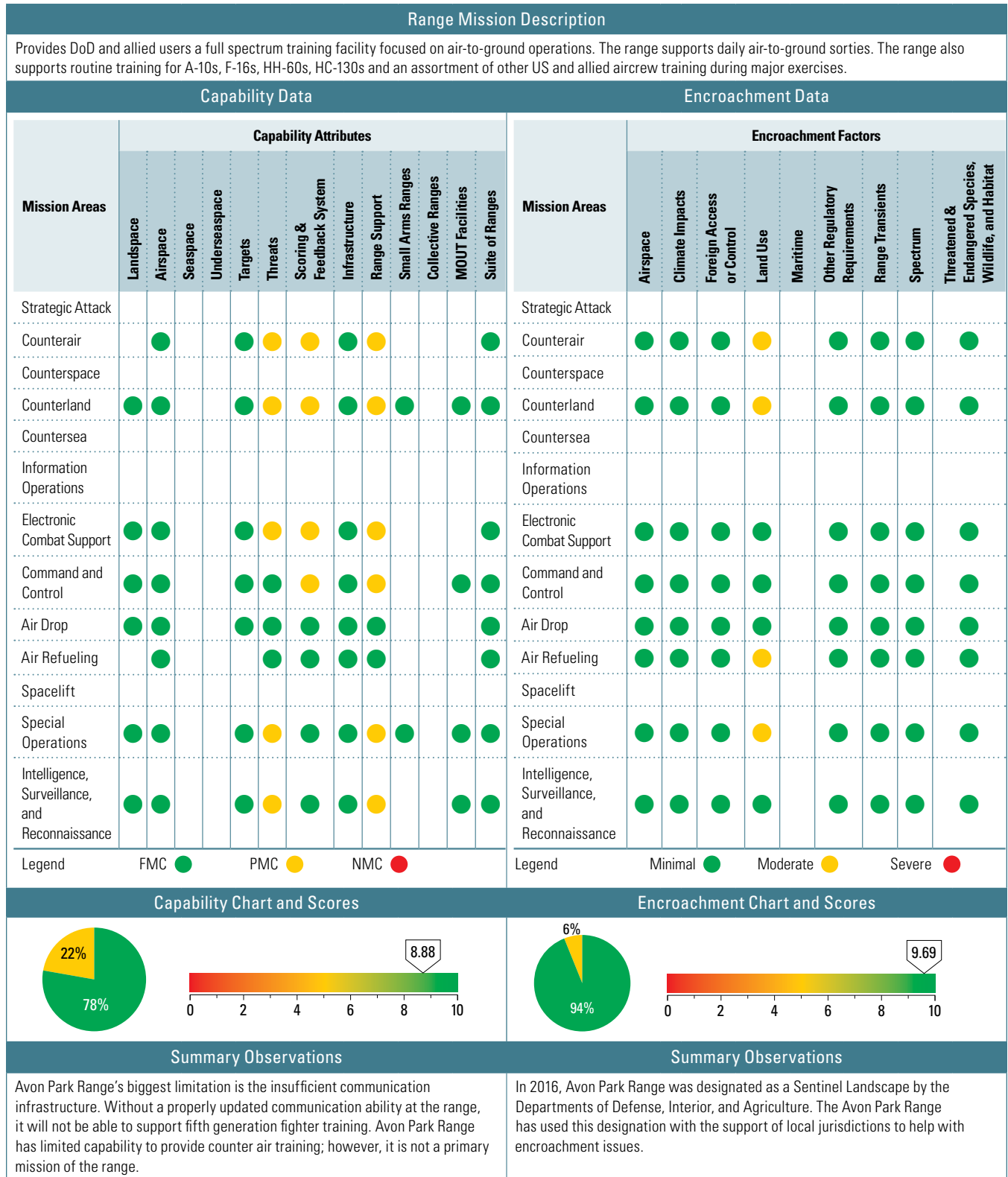
Attributes	Assigned Training Mission	Score	Comments
Targets	Counterland	●	Live weapons employment is not authorized on the impact area. Only training munitions are authorized. Prior coordination is required for inertially aided munitions (IAM) deliveries.
Scoring & Feedback System	Counterland	●	There is no scoring feedback system for airdropped munitions providing scores to aircrew. Aircrew have to VTR assess or ask range personnel for hit or miss feedback.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Airspace	Counterair	●	The Racer MOA can only be scheduled at the same time as the Jefferson Proving Ground (JPG) MOA with FAA prior approval in accordance with the FAA Letter of Agreement. This limits maximum airspace use on short notice. The planned remedy is to coordinate with the FAA for temporary MOAs and other airspace initiatives to provide the requested volume of airspace.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Avon Park Assessment Details



Avon Park Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	9.62	9.62	9.62	8.81	8.81	9.13	Encroachment Scores	9.32	9.32	9.32	9.57	9.57	9.69
The overall capability score at Avon Park has trended down with this year's report despite a surge in operations after receiving approval from Air Combat Command for VFR Uncontrolled Operations at the range. Now the 23 WG/CC is the approval authority to permit aircraft to operate uncontrolled in visual flight rules (VFR) weather. Previously, aircraft would have to land under LZSO-control which limited participation to HH-60s and HC-130s. The lower score is a result of the continued poor communication infrastructure. As the demand for high bandwidth continues with advancement of synthetic training capabilities, Avon Park Range's score will continue to fall as technology outpaces the range's ability to operate.							Overall scores have continued to slowly improve since 2008. The implementation of a Joint Land Use Study (JLUS) in conjunction with the Sentinel Landscape designation and aggressive public outreach has helped. We were successful over the past year to receive Readiness and Environmental Protection Integration (REPI) Program dollars to aid in land easements adjacent to the range.						

Avon Park Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Threats	Counterair	●	Avon Park Range has no high-fidelity, surface-to-air threat replication capability. Lack of high-fidelity threats limits the quality of training, especially during large force exercises. There are no current plans to integrate high-fidelity threats at the range.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance and Reconnaissance	●	Same as above.
Scoring & Feedback System	Counterair	●	Avon Park Range lacks any TSPI/P5 Towers/ACMI capability. This limits fidelity to reconstruct/debrief/replay air-to-air or air-to-ground training. There are no current plans to integrate TSPI/P5 Towers/ACMI due to the outdated communication infrastructure at the range.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Avon Park Range lacks the ability to train in electronic warfare operations. This limits which units can use the range. There are no current plans to invest in the ability to execute electronic warfare operations at the range.
	Command and Control	●	Avon Park Range lacks a communication infrastructure and aircraft monitoring system needed to train to battlespace management. This limits what exercises the range can support. There are no current plans to invest in the ability to execute command and control at the range.
Range Support	Counterair	●	With the VFR Uncontrolled Ops Waiver, tempo has continued to increase. Range manning has not been updated to keep pace with the additional workload; therefore, Avon Park cannot support all incoming training requests. Additionally, the range lacks SIPRNET capability. Units have to reschedule or are being denied range time. Lack of SIPRNET limits training fidelity and complicates range scheduling. Avon Park Range staff will pursue a manpower survey and seek additional manpower authorizations. SIPRNET capability will be pursued once the communications infrastructure upgrade is complete.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Command and Control	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance and Reconnaissance	●	Same as above.

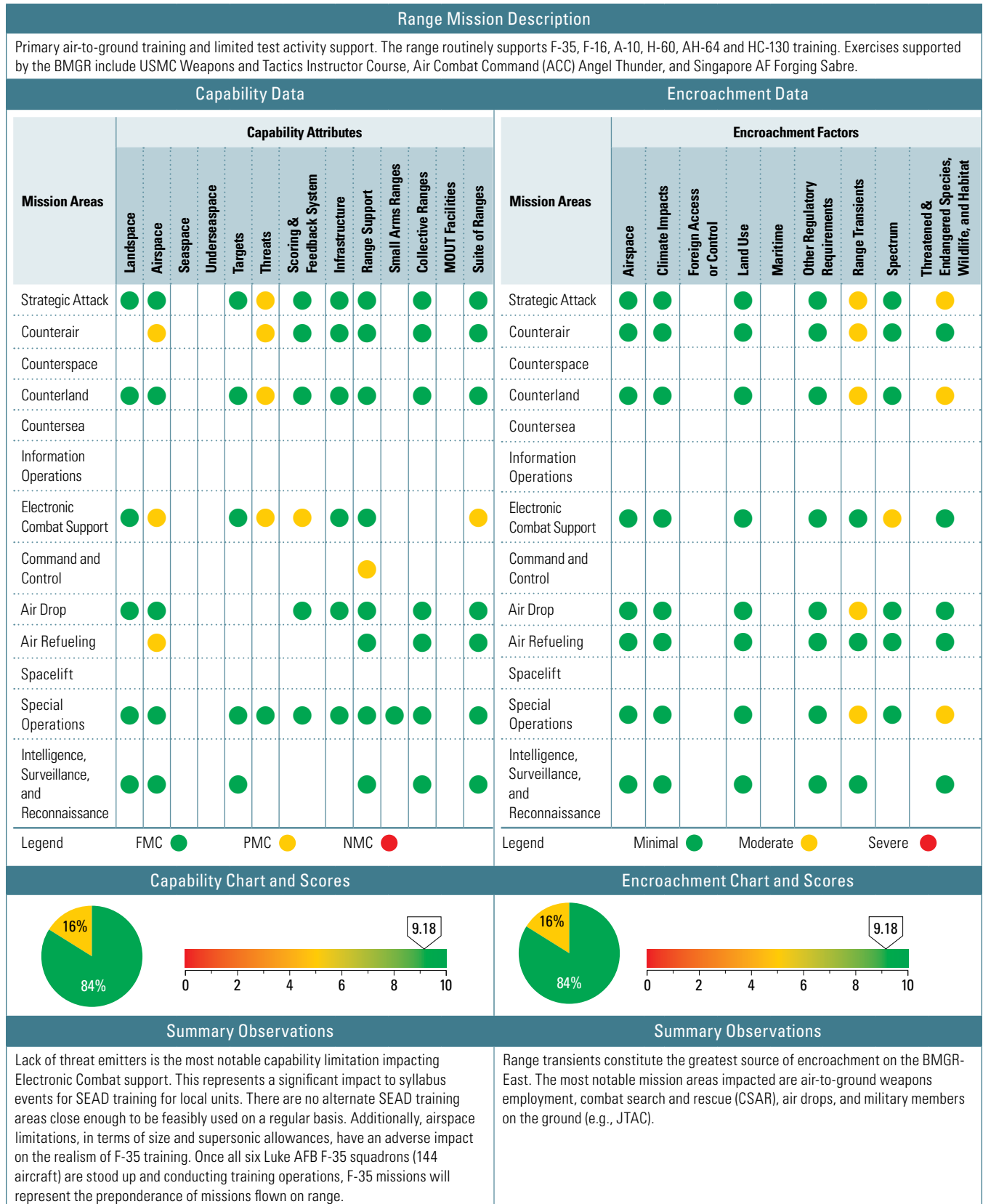
Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)**Avon Park Detailed Comments**

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Land Use	Counterair	●	The population of central Florida continues to rise and the available lands around the range continue to be developed. As land development continues, noise issues and incompatible land use will increase. Avon Park Range continues to work closely with regional planners to implement the JLUS and with state and federal partners for implementation of the Sentinel Landscape.
	Counterland	●	Same as above.
	Air Refueling	●	Same as above.
	Special Operations	●	Same as above.

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Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Barry M. Goldwater Range (BMGR) Assessment Details



Barry M. Goldwater Range (BMGR) Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	8.77	8.77	8.77	8.77	8.77	9.11	Encroachment Scores	9.13	9.13	9.13	9.13	9.13	9.20
<p>Most range capabilities have been sustained or slightly improved since the previous report; however, the arrival of the F-35 has exposed two shortfalls, threat emitters/simulators and airspace. For SEAD, the F-35 is optimized to detect, engage, and destroy robust integrated air defense system (IADS) networks; this requires multiple high-fidelity threat simulators (electronic emitters, rotating radar dishes, and realistic mock-ups) arranged in dense configurations. F-35 pilots engaging simulated IADS on range need to exercise the “kill chain” from start to finish. The BMGR’s current emitter capabilities are not sufficient to support this type of training. Two emitters that are skin trackers are expected to replace two identification, friend or foe (IFF) tracking emitters on range, and these should add a new element to F-35 SEAD support. Additionally, two JTEs are projected for the BMGR in FY19, but these are IFF trackers and therefore not as capable for supporting the F-35’s mission. For airspace, many of the F-35 missions require a large volume of airspace to effectively execute tactical employment training, and this will put unprecedented pressure on existing airspace capacity and the range scheduling process. To alleviate this projected pressure, current airspace and range operating hours may need to be expanded. Also, expanded supersonic authorizations are needed within SUA to realistically accomplish a wide range of F-35 tactical scenarios.</p>							<p>Encroachment scores have remained relatively constant for BMGR-East. The likelihood of incompatible development around the range remains low and is not projected to increase dramatically. Alternative energy development in the immediate vicinity has been limited; however, any proposed development of solar towers or wind turbines could become an issue. Encroachment due to border-related issues may increase due to the potential for increased enforcement efforts in the very near future. The impact of threatened and endangered species recovery and protection are difficult to predict. The most recent Sonoran pronghorn recovery plan projects delisting in 2036 based on current recovery efforts. Population increases necessary for delisting will probably result in more daily target closures for the next 20 years. To prevent adverse impacts to training, 56 RMO will continue to work with USFWS to identify ways to minimize potential impacts, perhaps through changes in the Biological Opinion or other means. Spectrum encroachment has perhaps the greatest potential for impacting the range’s ability to support assigned users’ training needs. Most users have a requirement to train in a contested/degraded environment and if the continuous demand for spectrum limits the range’s ability to support this requirement, training will be negatively impacted. Complying with cultural resource management requirements was identified as an encroachment concern in the 2015 report; however, this finding does not accurately describe the issue and cultural resource requirements are no longer identified as encroaching on mission accomplishment. While there are literally thousands of cultural resources on the BMGR-East, the range encompasses more than one million acres and training and support activities can be designed to avoid sensitive areas while accomplishing the mission. In cases where adverse effects to cultural resources cannot be avoided, allocating the resources (both the time and funds required) to mitigate those effects can have a temporary impact on training if not properly addressed in programming.</p>						

Barry M. Goldwater Range (BMGR) Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Airspace	Counterair	●	Based on F-35 mission execution, the current volume of airspace is insufficient and supersonic allowances are too restrictive. The impact is that training realism is adversely affected. Meetings with the FAA have occurred; but due to national airspace constraints, options to expand current airspace dimensions are very limited. Options to expand supersonic operations are being weighed against community relations concerns and National Environmental Protection Act processes.
	Electronic Combat Support	●	Same as above.
	Air Refueling	●	Two of three assigned refueling tracks are located within SUA. The impact is that airspace deconfliction leads to training mission restrictions while tanker operations are occurring in the airspace.
Threats	Strategic Attack	●	There is an insufficient number of threat emitters on the range. Mission training against enemy IADs is adversely affected. Air Education and Training Command (AETC) and ACC have been made aware of the need for more emitters, but programmatic acquisition timelines will not improve the situation until FY2019 or later.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.
Scoring & Feedback System	Electronic Combat Support	●	There are currently no electronic means for real-time feedback capability based on Electronic Counter Measures (ECM) or maneuver. The impact is that validation of tactics mission executions is adversely affected. There is an ongoing effort with ACC to test a new Electronic Attack Receiver to provide the needed feedback to pilots.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Barry M. Goldwater Range (BMGR) Detailed Comments**Capability Observations**

Attributes	Assigned Training Mission	Score	Comments
Range Support	Command and Control	●	There is very limited capability for Command and Control (C2) training operations. No infrastructure exists to support operational C2 (air operations center) if desired. Land Mobile Radio (LMR) coverage is lacking. Air/ground advisory service is available but an air traffic control (ATC)-like facility and the positive control necessary to sustain future operations is not available. Impacts to training include safety concerns for ground-based training and restrictions to aircrew based on low situational awareness from a C2 perspective. Planned actions include: continuing to grow the current C2 node in support of range and airspace operations; assessing LMR repeater architecture as a gap fill capability; and assessing an ATC-like facility for requirements/funding. This ATC-like facility is critical due to anticipated future real-time airspace sharing with the FAA and the expected integration of different assets downrange.
Suite of Ranges	Electronic Combat Support	●	There are an insufficient number of threat emitters on the range. Mission training against enemy IADs is adversely affected. AETC and ACC have been made aware of the need for more emitters, but programmatic acquisition timelines will not improve the situation until FY2019 or later.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Range Transients	Strategic Attack	●	Illegal human traffic and resulting law enforcement cross/access the BMGR-East which can negatively impact training. Discovery/detection leads to cease weapons expenditures (ineffective sorties), disruption of ground operations, and/or range closure. Planned actions include continued interaction with Border Patrol sectors, Customs and Border Protection (CBP), including CBP Air; continued research on feasibility of ground-based ground detection radar systems in the interest of human safety; and coordination with local law enforcement agencies.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Air Drop	●	Same as above.
	Special Operations	●	Same as above.
Spectrum	Electronic Combat Support	●	Given the proliferation of cell phone and other frequency-consuming technologies, the continued reduction in available spectrum limits the range's ability to acquire needed frequency authorizations, thus limiting our ability to install and operate threat emitters and jamming equipment. This results in users not being able to complete assigned training tasks such as degraded/denied comm/GPS/datalink. Planned actions include monitoring changes in spectrum allocation and beginning the process of obtaining spectrum approval for new equipment very early in the planning process.
Threatened & Endangered Species, Wildlife, and Habitat	Strategic Attack	●	The presence of endangered Sonoran pronghorn and other species covered by conservation agreements impacts operating hours, closes individual targets to ordnance deliveries, and restricts the scheduling and conduct of range maintenance and support activities. This impacts training by limiting the time available on the daily schedule for ordnance delivery missions on North Tactical Range (TAC) and South TAC is reduced by at least an hour to allow completion of monitoring activities. Individual targets may be closed due to the presence of animals in the immediate vicinity. This is especially limiting for air-to-ground guided missiles (AGM) and high explosives (HE) missions, which may be cancelled due to target closures. The tactical range maintenance schedule is almost entirely determined by threatened and endangered species constraints and conservation agreements. This limits the range management office's ability to flex to support special events and specific user requirements. Planned actions include continued participation in species recovery actions and implementation of protective measures to ensure that the mission can be accomplished within regulatory requirements.
	Counterland	●	Same as above.
	Special Operations	●	Same as above.

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Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Blair Lake Assessment Details



Blair Lake Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	7.31	7.31	8.61	N/A	8.43	8.52	Encroachment Scores	9.09	9.09	8.64	N/A	8.86	8.85
Blair Lake capabilities are not expected to change either negatively or positively in the next five years. F-35 basing at Eielson AFB is not expected to impact range use.							Encroachment scores have not changed significantly in the recent past, nor are they expected to change significantly in the next five years. The limited mission, limited use, and remote nature inhibit encroachment impacts.						

Blair Lake Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landscape	Counterair	●	The small range limits air operations to small-unit tactics such as basic fighter maneuvers (BFM) or air combat maneuvering (ACM). This can be partially mitigated by scheduling the adjacent Eielson MOA simultaneously, providing up to a four ship of air cover. However, the range does allow for regeneration of Opposing Forces air assets during large force employments in adjacent airspace.
	Counterland	●	The small range limits air operations to small-unit tactics such as BFM or ACM. This can be partially mitigated by scheduling the adjacent Eielson MOA simultaneously, providing up to a four ship of air cover. Also, there is limited terrain available in/near infrastructure and targets that is conducive to vehicle and foot traffic. Most of the terrain is sensitive tundra and wetlands.
	Special Operations	●	Same as above.
Airspace	Counterair	●	The small range limits air operations to small-unit tactics such as BFM or ACM. This can be partially mitigated by scheduling the adjacent Eielson MOA simultaneously, providing up to a four ship of air cover. However, the range does allow for regeneration of Opposing Forces air assets during large force employments in adjacent airspace.
	Counterland	●	The small range limits large force air operations in support of counterland. This can be partially mitigated by scheduling the adjacent Eielson MOA simultaneously. The range can support a four ship or less for CAS training.
Targets	Counterland	●	There is limited infrastructure, targets, and suitable maneuver spaces for large scale training operations. Small unit movement and small CAS scenarios are supportable. Sensitive tundra terrain and isolated location prohibit further development.
	Air Drop	●	Air drop is limited to the main complex and must avoid target impact areas. The target sizes are small and in close proximity to habitable structures, thus restricting allowed munitions. Surrounding terrain is muskeg/permafrost soils and is not conducive to movement on foot. The only remedy is expensive gravel excavation and backfill.
	Intelligence, Surveillance and Reconnaissance	●	Year-round access is limited, inhibiting placement of command, control, communications, computers, and intelligence, surveillance and reconnaissance (C4ISR) targets. There is no cost effective remedy until permanent year-round access is secured.
Threats	Counterland	●	Surface-to-air threat emitters are not normally present on the range. They could be placed on the range; however, it is logistically and financially challenging.
	Electronic Combat Support	●	Surface-to-air threat emitters are not normally present on the range. They could be placed on the range; however, it is logistically and financially challenging. Additionally, placement of electronic emitters is further restricted due to their proximity and line-of-sight to critical FAA radars and communications nodes.
	Special Operations	●	Same as Counterland.
	Intelligence, Surveillance and Reconnaissance	●	Same as above.
Scoring & Feedback System	Intelligence, Surveillance and Reconnaissance	●	There are currently limited feedback and scoring capabilities for any type of C4ISR training.
Infrastructure	Air Drop	●	The range is isolated and remote; therefore, all air drop, except in the winter months when ice bridge is in place, requires air assets to recover loads.
	Intelligence, Surveillance and Reconnaissance	●	The isolated and remote nature of the range limits the placement of C4ISR targets and feedback systems.
MOUT Facilities	Special Operations	●	Existing infrastructure could be used for small-unit tactics but they are not true MOUT facilities. Additionally, there are no small-unit tactics feedback systems permanently installed.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)**Blair Lake Detailed Comments**

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Airspace	Counterair	●	Air space volume is too small for large force employment. Strictly designed for a 4-ship maximum and can only support simple/basic tactics execution.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Air Drop	●	Same as above.
	Special Operations	●	Same as above.
Other Regulatory Requirements	Counterland	●	The surrounding terrain is sensitive muskeg/permafrost soils. It is not conducive to movement by vehicle or foot during summer months. Targets are limited to a small number of bombing circles where permafrost soils have been mitigated. The only remedy is expensive gravel excavation and backfill.
	Special Operations	●	Same as above.
Spectrum	Electronic Combat Support	●	There is limited capability to place threat emitters on the range. They have to be flown in during summer months, or hauled over an ice bridge in the winter and left there. Similarly, personnel to operate the threat emitters must be flown-in and out, adding significantly to the operating and maintenance costs. Moreover, the airspace lateral and vertical limits may limit tactics to familiarization operations only. Lastly, the close proximity and direct line of site to critical FAA radars limits the type and quantity of emitters.

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Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Bollen Assessment Details

Range Mission Description																							
Provide a quality, realistic, tactical range environment for Air-to-Ground, Airdrop and JTAC training to ensure the combat readiness of flying units throughout the Northeast and Mid-Atlantic region. Provide safe and effective year-round, day and night, Joint multiple-service combat training operations for multiple ANG, AFRC and AD fighter, airlift, ARNG helicopter, RPA/UAS, Special Operation Forces and JTAC units. Capable of supporting missions to include BSA, SAT, CAS, CSAR, AI, JAAT, Aerial Gunnery, Aerial Resupply, JTAC, RPA and UAS operations. Primary Users: 175WG, 113WG, 177FW, 106RQW, 3AS, 6AS, 9AS, 89AS, 105AW, 106RQS, 109AW, 166AW, 167AW, 179AW, 193SOW, 326AS, 709AS, 732AS, 911AW, 57WPS, 1/104ARB, HMLA-773, HMM-772, 2IBCT, 56SBCT and multiple JTAC, ASOG, ASOS, STS and SFG units.																							
Capability Data													Encroachment Data										
Mission Areas	Capability Attributes												Mission Areas	Encroachment Factors									
	Landspace	Airspace	Seaspace	Underspace	Targets	Threats	Scoring & Feedback System	Infrastructure	Range Support	Small Arms Ranges	Collective Ranges	MOUT Facilities		Suite of Ranges	Airspace	Climate Impacts	Foreign Access or Control	Land Use	Maritime	Other Regulatory Requirements	Range Transients	Spectrum	Threatened & Endangered Species, Wildlife, and Habitat
Strategic Attack	●	●			●	●	●	●	●	●	●	●	●	Strategic Attack	●	●	●	●		●	●	●	●
Counterair	●	●			●	●	●	●	●	●	●	●	●	Counterair	●	●	●	●		●	●	●	●
Counterspace														Counterspace									
Counterland	●	●			●	●	●	●	●	●	●	●	●	Counterland	●	●	●	●		●	●	●	●
Countersea														Countersea									
Information Operations														Information Operations									
Electronic Combat Support														Electronic Combat Support	●	●	●	●		●	●	●	●
Command and Control	●	●			●	●	●	●	●	●	●	●	●	Command and Control	●	●	●	●		●	●	●	●
Air Drop	●	●			●	●	●	●	●	●	●	●	●	Air Drop	●	●	●	●		●	●	●	●
Air Refueling														Air Refueling									
Spacelift														Spacelift									
Special Operations	●	●			●	●	●	●	●	●	●	●	●	Special Operations	●	●	●	●		●	●	●	●
Intelligence, Surveillance, and Reconnaissance	●	●			●	●	●	●	●	●	●	●	●	Intelligence, Surveillance, and Reconnaissance	●	●	●	●		●	●	●	●
Legend	FMC ●				PMC ●			NMC ●					Legend	Minimal ●			Moderate ●			Severe ●			
Capability Chart and Scores													Encroachment Chart and Scores										
<div><div><div></div><div>16%</div><div>84%</div></div><div><div></div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div>9.22</div></div> <td colspan="10"><div><div><div></div><div>17%</div><div>83%</div></div><div><div></div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div>9.14</div></div></td>													<div><div><div></div><div>17%</div><div>83%</div></div><div><div></div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div>9.14</div></div>										
Summary Observations													Summary Observations										
The range's main capability issue is limited airspace. The size of the current airspace needs to be modified and expanded. Use of some munitions is restricted due to the small size of the impact area.													Main encroachment issue is small size of the airspace. Airspace expansion and modification using a temporary MOA would double the size of current airspace. This modified airspace will not interfere with Victor Airways surrounding the increased training airspace.										

Bollen Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	8.90	8.90	8.77	8.77	8.77	9.61	Encroachment Scores	9.43	9.43	9.15	9.15	9.15	9.54
ANG has implemented a capabilities sharing program for threat emitters by mobilizing its emitter capabilities for scheduled exercises and training rotations. The size of the current airspace needs to be modified and expanded. Discussions with local, regional and national FAA agencies have taken place regarding modifying the existing airspace. The way forward would be an annual activation of a temporary MOA verifying the proof of concept over time that ultimately leads to permanent airspace modification and expansion. The range is continuously exploring the possibility of supporting new range users and missions. Integrated training has increased and is accomplished on a non-interference basis with existing training missions.							As a joint use facility, Bollen Range maintains a positive relationship with Army Range Operations; therefore, simultaneous Army/Air Force operations are deconflicted. The Army has abandoned some of its ground training ranges that could be utilized in the future with new targets arrays for air-to-ground use. This would require EOD personnel to clear areas which would be accomplished during semi-annual range maintenance. Increasing the size of the airspace with a temporary MOA would make training more realistic. Fifth generation fighters will not be able to train realistically without larger airspace and an updated noise assessment. Realistic fifth generation precision weapons delivery patterns also require larger airspace.						

Bollen Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landscape	Strategic Attack	●	The range land area is small. The small land area restricts range activities and tactics. There is currently no planned remedy.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Air Drop	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance and Reconnaissance	●	Same as above.
Airspace	Strategic Attack	●	The range's airspace is small. The small airspace limits tactics and weapons deliveries. Planning has begun to explore the use of a temporary MOA to increase the airspace.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Air Drop	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance and Reconnaissance	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Strategic Attack	●	The range's available airspace is small. The small airspace limits tactics and weapons deliveries. Planning has begun to explore the use of a temporary MOA to increase the airspace.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Command and Control	●	Same as above.
	Air Drop	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance and Reconnaissance	●	Same as above.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

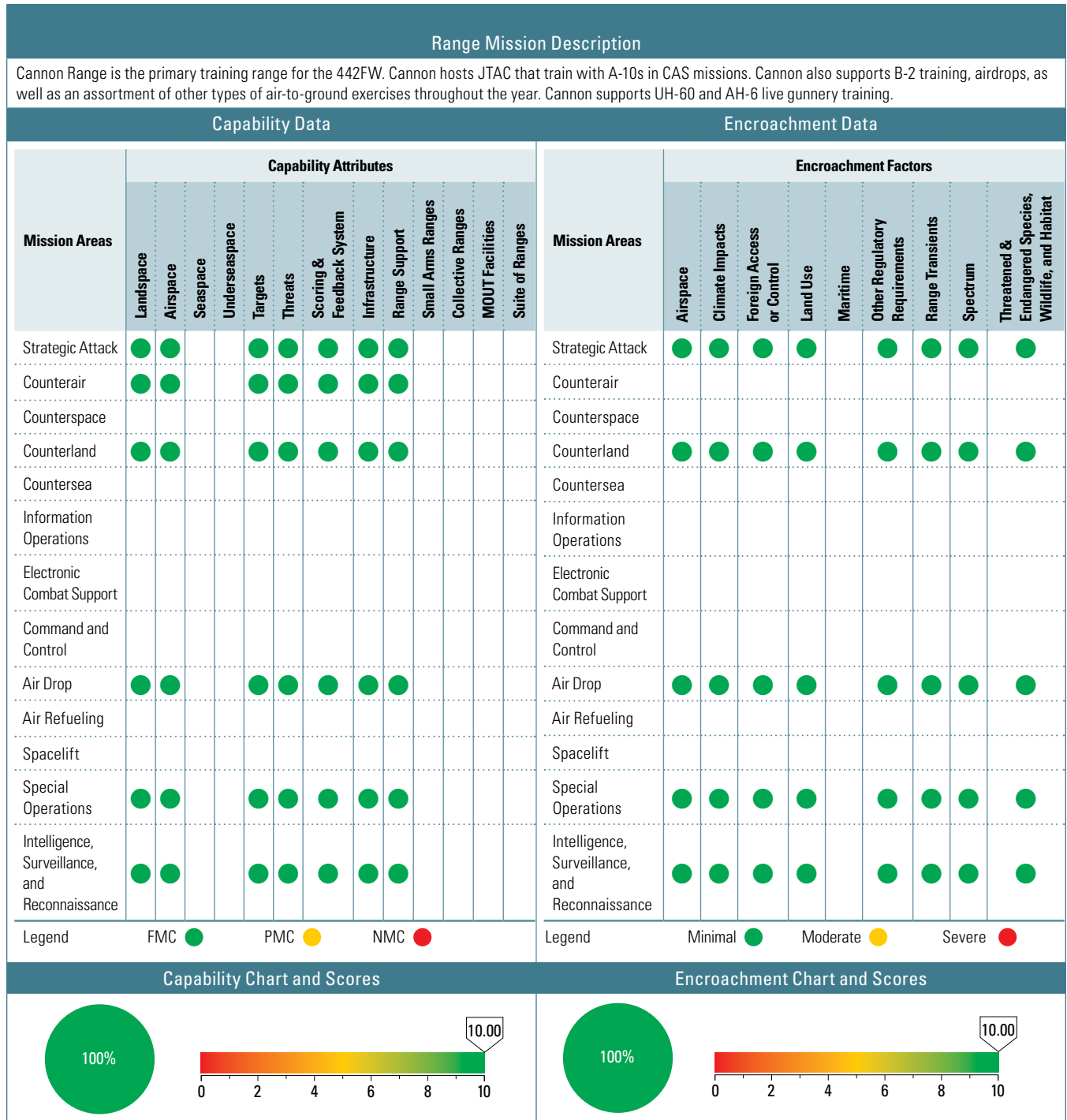
Bollen Detailed Comments

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Other Regulatory Requirements	Strategic Attack	●	Range use is restricted between 2300 hours–0700 hours local. These restrictions limit night training. There is currently no planned remedy. Late night hours are restricted by US Army to maintain good community relations.
	Counterair	●	Same as above.
	Counterland	●	Same as above.

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Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Cannon Assessment Details



Cannon Assessment Details

Summary Observations							Summary Observations						
During this year's assessment of Cannon Range capabilities, the Air Force has taken a more realistic approach and analyzed the range from a primary user standpoint. Therefore, the range's scores have increased significantly. The range's capabilities, while not perfect, are suitable for the current primary users' training requirements. If the primary users change, or their aircraft change, then Cannon will need increased airspace capability and most likely Electronic Warfare tools to provide future users with what they need. Fifth generation fighters will require changes to capabilities in order to meet their more robust training requirements.							Cannon Range encroachment score has increased (i.e., fewer encroachment issues) due to continuously improved scheduling deconfliction between Cannon Range and Fort Leonard Wood (FLW) Range. While the Army still actively uses Range 24 (.50 caliber surface danger zone overlays a portion of Cannon Range), the range's ability to coexist and ensure both services get the training they need has improved. Cannon Range has not lost any aircraft mission capability this year due to conflicting Army/AF training requirements. There may be times in the future that this could occur. If Fort Leonard Wood has a battalion getting ready to deploy then they have expressed the desire to not allow aircraft missions for a given day, but with over 270 flight days per year, this isn't considered an impactful encroachment issue. Other than the challenges of coexisting with Army ranges, Cannon Range hasn't encountered any major or minor encroachment challenges. The range is surrounded by the Mark Twain National Forest which limits encroachment.						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	5.17	5.17	5.17	5.09	5.09	7.28	Encroachment Scores	9.05	9.05	9.05	9.11	9.11	9.40
As stated above, this year the range's capabilities were assessed from a user requirements perspective. Currently, Cannon Range is providing all the requested/desired/required training needs for the primary users, which centers around Close Air Support and Counterland/Strategic Attack. Recent improvements to communications infrastructure have kept Cannon on par with other training ranges, allowing the range the speed necessary to function while ensuring future communications needs will be met as well. Cannon Range is currently working with Civil Engineering and NGB/A4 to design a new control tower and range facility building. The current tower was built in 1980, with a new cab installed in 1998. This facility does not meet safety standards for rail height or stair design. The proposed design increases tower height from 50' at the top of the cab, to approximately 75'. This new height will increase scoring capability immensely for a good portion of range targets, while incorporating up-to-date safety standards. The current range facility building was originally built in 1978 and has been added to over the years to create a patch worked building that is not up to AF standards. Constructing a new building, along with inside plant communications and electrical upgrades, will ensure Cannon remains at the forefront of future mission considerations.							Continuous efforts to improve business practices between Cannon Range and FLW have slowly, year by year, allowed a seamless process for deconflicting AF and Army mission requirements. Currently we are at a near zero mission degradation due to FLW encroachment. Long-term disadvantages of being on an Army installation shouldn't be overlooked, as competing interests could be a challenge to future range planners and commanders. Range 24, FLW's only .50 caliber live fire range, has been a challenge since its' construction around 2005. But as stated above, through judicious scheduling we have ensured very minimal mission impact to Cannon Range. Fort Leonard Wood Range schedulers have shown an eagerness to ensure all mission requirements are met, regardless of branch of service.						

Cannon Detailed Comments

Capability Observations

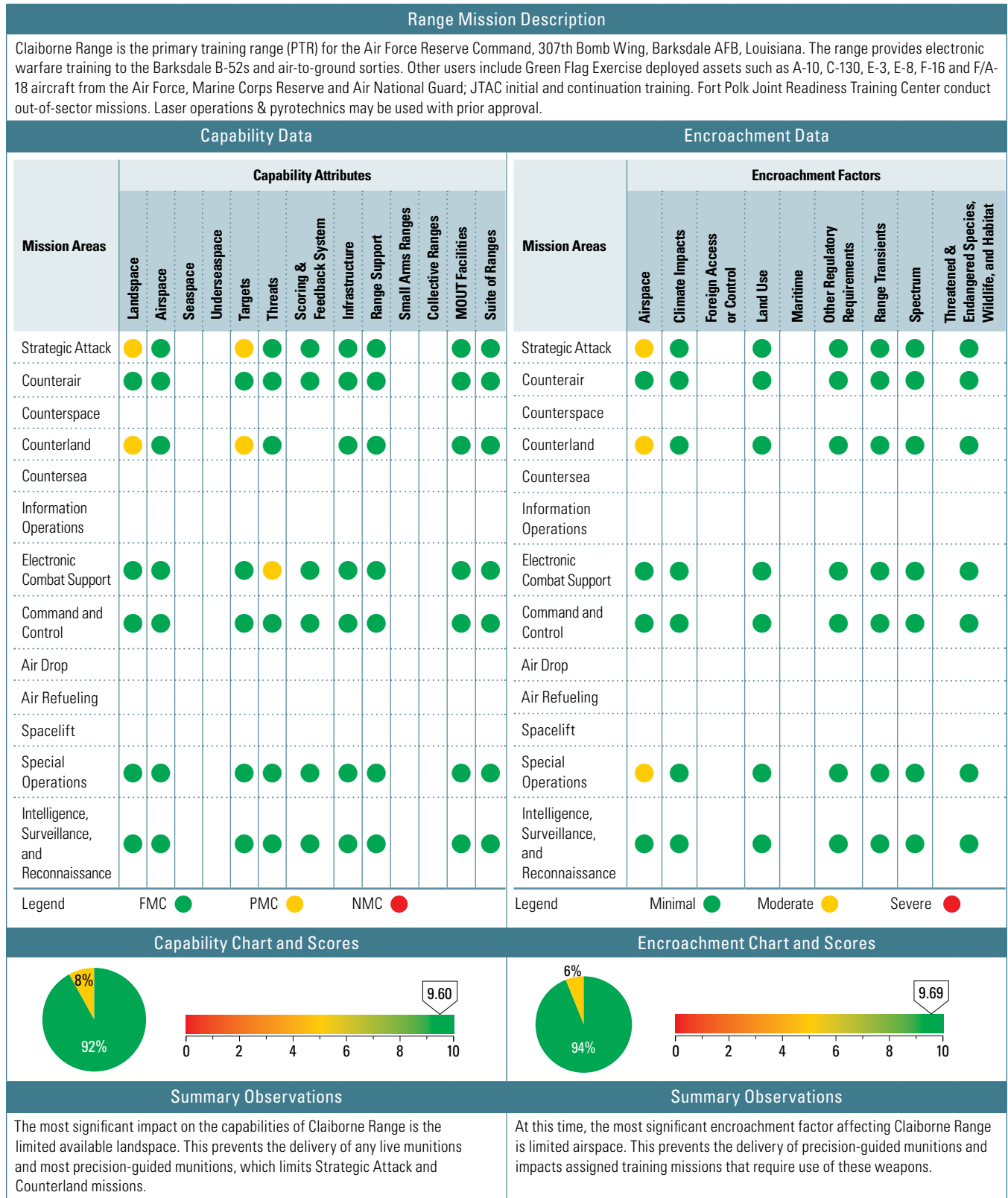
Attributes	Assigned Training Mission	Score	Comments
No comments.			

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
No comments.			

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Claiborne Assessment Details



Claiborne Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	6.56	6.56	7.86	6.67	6.67	9.51	Encroachment Scores	10.00	10.00	10.00	10.00	10.00	9.70
According to F2011-0080-FDS000, Installation Report of Audit, Air Force Range Optimization, 307th Bomb Wing, Barksdale Air Force Base, Louisiana dated 30 June 2011, the development of an Electronic Warfare Program at Claiborne Range results in a potential cost savings of more than \$6M annually in reduced flying hours for the B-52 units stationed at Barksdale. As of 2014, the Claiborne Range EW program was operational with a Joint Threat Emitter and a Multiple Threat Emitter System, as well as the required frequency authorizations and more training airspace with the CADD0 ATCAA. This change in mission focus resulted in reduction of the capabilities assessment for Claiborne Range; however, the recent establishment and ongoing enhancements to the EW program have improved this rating for 2018. More progress is projected as EW systems improve and specific targets are developed for precision-guided munitions.							The Environmental Assessment of Increased Utilization and Expansion of the Claiborne Air-to-Ground Weapons Range completed in March 2003 resulted in the expansion of the land and airspace available for B-52 training and the employment of new weapons systems. This expansion allowed for the employment of new munitions and expanded training events on existing targets and further improvements are projected for 2018 and beyond. Limited airspace is the encroachment factor with the most significant impact upon current operations; however, this impact will be mitigated with the addition of new targets designed specifically to accommodate B-52 delivery of precision-guided munitions within the existing airspace.						

Claiborne Detailed Comments

Capability Observations

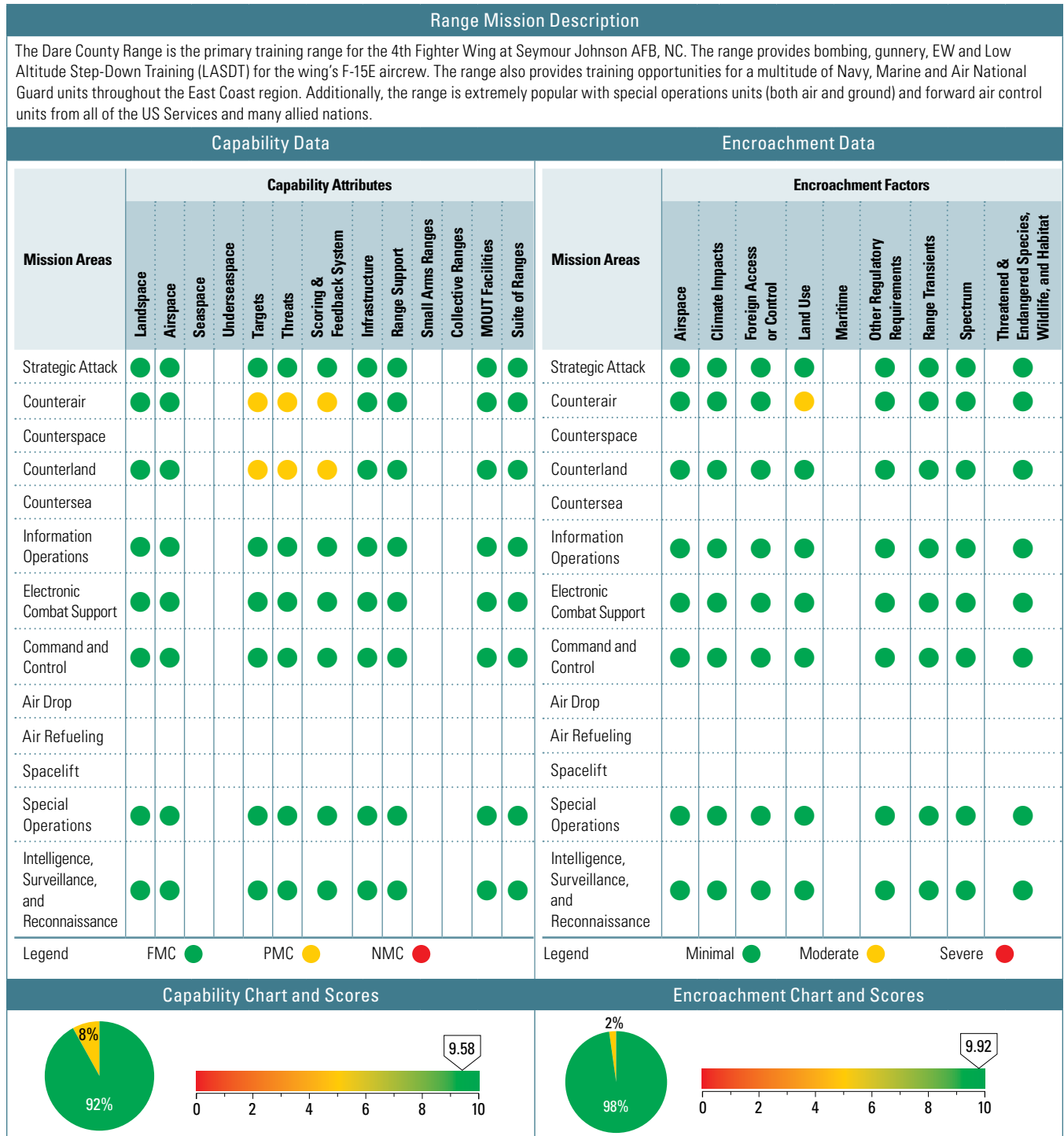
Attributes	Assigned Training Mission	Score	Comments
Landspace	Strategic Attack	●	Limited available landspace prevents the use of any live and most precision-guided munitions. The establishment of new targets within the existing range boundary will increase range capabilities.
	Counterland	●	Same as above.
Targets	Strategic Attack	●	The lack of any target designed and positioned for precision-guided munitions prevents units from training with JDAMs and LGBs. By the end of 2018, new targets will be developed within the existing range boundary.
	Counterland	●	Same as above.
Threats	Electronic Combat Support	●	There is a lack of readily available parts for the electronic warfare equipment. This imposes significant limitations on the available EW training. Claiborne Range is collaborating with other ranges and supply channels to identify specific limiting factors and develop remedies.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Strategic Attack	●	There are airspace constraints to the south-east of the range which prevents sufficient run-in time for B-52 precision-guided munitions delivery. New targets are being developed to accommodate B-52 precision-guided munitions delivery within existing airspace constraints.
	Counterland	●	Same as above.
	Special Operations	●	Same as above.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Dare County Assessment Details



Dare County Assessment Details

Summary Observations	Summary Observations
<p>The Dare County Range does not own a robust array of high fidelity target sites. High fidelity targets enable aircrew to train against realistic combat targets. For example, aircrew can train to find a SCUD and see what it looks like on their system displays. 4 FW is currently working with regional joint partners as part of the East Coast Battlespace Joint Working Group to identify the requirements to acquire more realistic target arrays for all of the East Coast ranges. The range recently received one Modular Threat Emitter (MTE) to train against. The MTE only replicates one legacy threat system (SA-6), and it does not provide replication against any advanced threat systems. Combatant Commands (COCOM) require combat air forces (CAF) units to be prepared to fight and accomplish the mission in a contested/degraded environment. Future conflicts will likely require the destruction or mitigation of sophisticated surface-to-air threats to accomplish COCOM objectives. This requires high-quality training and feedback to assess maneuvers. The MTE can only provide 4 FW crews with a part-task trainer threat capability because it cannot replicate multiple threat systems. In order to train against multiple threats, 4 FW crews must work with outside agencies (USN/USMC) to schedule appropriate airspace and emitters to conduct this training. Even the USN/USMC ranges provide limited advanced threat emitter training, because no units on the East Coast currently possess the capability to train against advanced double-digit Surface-to-Air Missile threats. The 4 FW is working with HHQ and joint partners to acquire an unmanned emitter(s) for the region which can be remotely controlled/operated and can replicate multiple threats in one system. Ideally, this system can switch between threats quickly, and will have a mechanism for determining precision of shots based on jamming/maneuvers. This type of high fidelity emitter located on Dare County Bombing Range, combined with the ability to tie in our new Live Mission Operations Center for targeting will significantly increase the threat emitter's fidelity. In addition to the emitter(s), contract support infrastructure will be required to operate and maintain the equipment. An advanced threat array combined with the appropriate feedback mechanism will enable all 4 FW crews to train against advanced threats prior to combat deployments. Additionally, it will provide 4 FW and East Coast DoD assets the ability to train in a complex EW environment during large force exercises such as Exercise RAZOR TALON.</p>	<p>The most significant encroachment issue facing the Dare County Range complex is the influx of wind energy companies which are attempting to build wind farms in the vicinity of the lateral boundaries of the range complex or within the Military Training Routes (MTR) leading into the range complex. Wind farms can potentially have significant impacts on the training mission of the 4 FW. Wind farms have the potential to adversely affect the ability of the Formal Training Units (FTU) to provide quality training to new F-15E students and for the Operations Squadrons to train to their Ready Aircrew Program requirements. The existence of multiple wind turbines that reach heights of 500 feet above ground level (AGL) (or greater) in or near military training airspace pose potential flight safety risks to aircrew. This is due to physical height of the obstacles themselves, as well as their potential to mask light civilian aircraft on the air-to-air radar. Because of these factors, wind farms in the vicinity of the range complex can potentially render the airspace unusable for low-altitude air-to-air intercepts, which is a syllabus requirement for FTU students and a necessary skillset for operational squadrons conducting homeland defense missions. Wind turbines can also negatively impact the ability of F-15E aircrews to train to and utilize the Terrain Following Radar (TFR), which is one of the F-15E's primary combat readiness requirements.</p>

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)**Dare County Assessment Details**

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	9.95	9.95	9.59	10.00	10.00	9.58	Encroachment Scores	9.95	9.95	9.55	10.00	10.00	9.94
<p>Dare County recently received an SA-6 MTE which provides 4 FW aircrew with the ability to train against a threat emitter utilizing in-house assets. The 4 FW is working with HHQ and regional joint partners via the East Coast Battlespace Joint Working Group initiative to develop an integrated and robust threat array to train East Coast combat units. The 4 FW is also researching possible high fidelity target simulators to enable aircrew to train to find, fix and target realistic/representative threat systems. Air Combat Command's (ACC) new concept of regionalized training airspace to consolidate assets, combined with the continued growth of Exercise RAZOR TALON, drive the requirement to increase the operational capabilities of the range complex. The airspace along the North Carolina coast, consisting of the W-122 complex, the Burner ATCCA, the range complex, the R5306 complex and the Mid-Atlantic Electronic Warfare Ranges is unique within the region. ACC calls it the premier, joint Major Contingency Operations training airspace in the East region of the United States. The purpose of the East Coast Battlespace Joint Working Group is to develop this airspace into a robust, high fidelity IADS and target array which will simulate the enemy order of battle that would likely be present in future conflicts. This will allow all of the joint units within the region to train in contested and degraded environments against advanced threat scenarios during both large force exercises such as RAZOR TALON and daily unit-level training missions. Over the next three to five years, the requirement to train against advanced threat scenarios will become more important and more urgent to ensure aircrew can meet combat requirements.</p>							<p>Over the past several years, the threat of encroachment to the Dare County complex has increased significantly. Wind energy companies continue to research potential sites in Eastern NC for alternative energy exploitation. The unique geography of the land around the Dare County complex has been deemed conducive to harvesting wind energy. Two wind farm projects are already approved within the immediate vicinity of the range complex. The Little Alligator Wind Farm to the north of the Dare County complex introduced the concept of "curtailment". In this case, the site owners agreed to feather the fans on the towers for a specified amount of time when contacted by 4 FW units that plan to train to low altitude air-to-air intercepts within the range airspace. The curtailment agreement requires that the 4 FW flying squadrons coordinate with the wind farm operators prior to conducting training missions to ensure the safety of their aircrew and the effectiveness of their training missions once the wind energy facility is constructed and operational. The other approved project is the Pantego Wind Farm. This complex is located to the southwest of the range. The development of this wind farm may negatively affect TFR operations on VR-084, which is one of primary MTRs for executing low altitude ingress training into the Dare County. A mitigation agreement is in place to minimize impact produced by wind turbines on low altitude training. In addition to these two approved sites, there are currently three other proposed wind energy projects in the vicinity of the range complex.</p> <p>Airspace encroachment from wind energy companies will continue to be a factor in the next 3-5 years. As the owners of the range and several MTRs in Eastern NC, the 4 FW will continue to work with HHQ to mitigate the impacts of wind farm encroachment on F-15E training. North Carolina's laws currently help protect military airspace from wind energy encroachment. These laws will continue to be necessary in the next 3-5 years.</p>						

Dare County Detailed Comments

Capability Observations

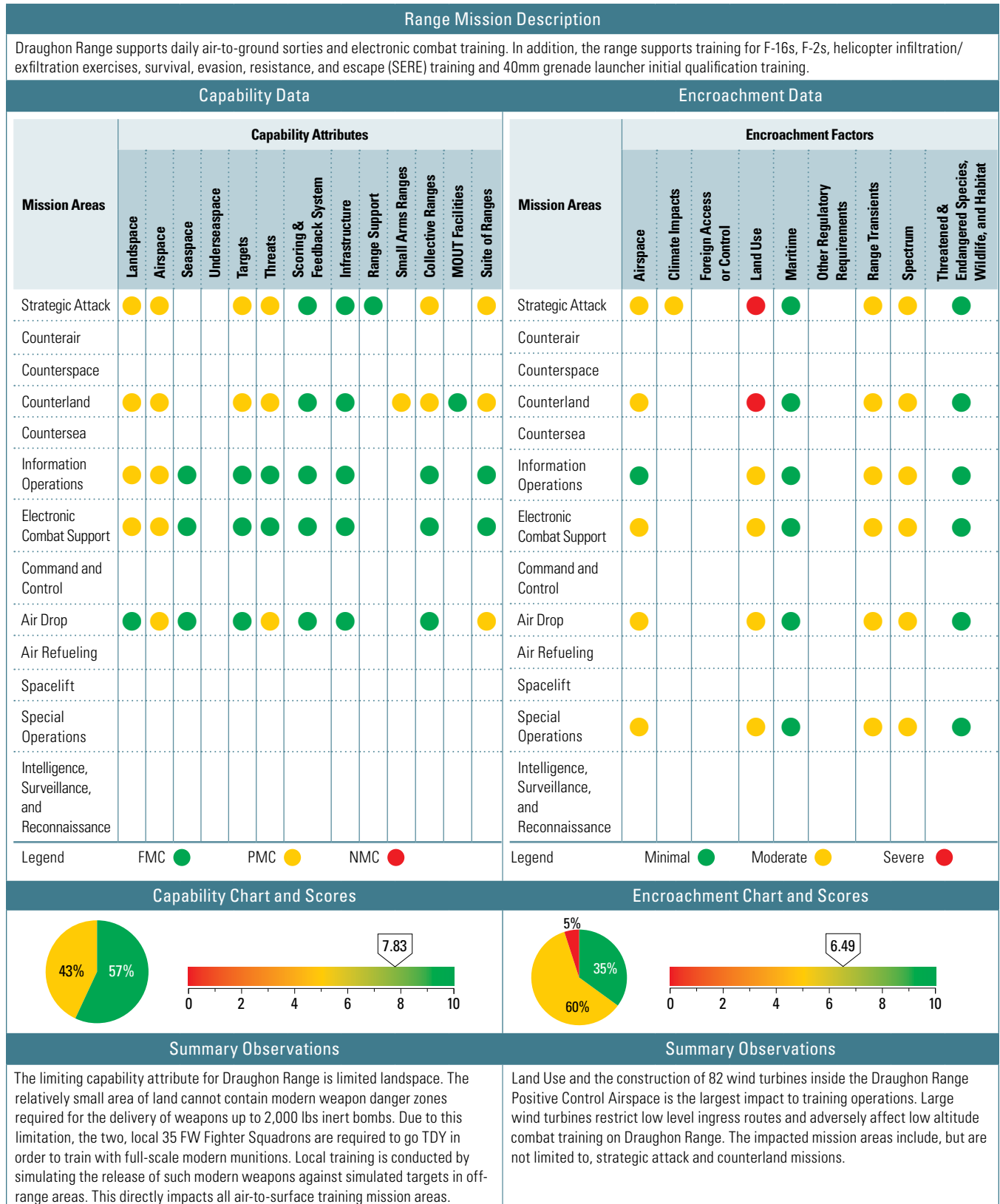
Attributes	Assigned Training Mission	Score	Comments
Targets	Counterair	●	The range does not have a robust array of high fidelity targets. Counterair and Counterland missions require aircrew to train with all of their systems to find/fix/destroy realistic target sets. Ideally, the high fidelity targets will be mobile/deployable and can be used across sites both on the range and within the vicinity of the range complex. Currently, 4 FW aircrew can only train against a limited number of high fidelity threats at the range (have SA-6 and SA-15 mock-ups). Aircrew must go to exercises at the Nevada Test and Training Range (NTTR) or the Utah Test and Training Range (UTTR) to see target arrays such as SCUDs or numerous threat emitters. Developing a joint plan to acquire multiple high fidelity targets for the East Coast ranges will enable more realistic target training scenarios for large force exercises such as Exercise RAZOR TALON. 4 FW is working with HHQ and joint partners to define the requirement for high fidelity targets. The acquisition process will likely extend out over the next three to five years.
	Counterland	●	Same as above.
Threats	Counterair	●	The range only has one legacy emitter. The range does not possess any advanced threat emitters. Counterair and counterland missions require the destruction or mitigation of advanced surface-to-air threats in order to accomplish the mission. Currently, 4 FW aircrew must work with outside agencies to schedule appropriate airspace and emitters to conduct training against a representative "threat array". The 4 FW's MTE only provides a part-task trainer capability when used by itself and it currently does not tie into the USN/USMC's electronic warfare ranges to the south. The 4 FW is working with HHQ and joint partners to acquire an unmanned emitter(s) for the region which can be remotely controlled/operated and can replicate multiple threats in one system. Ideally, this system can switch between threats quickly, and will have a mechanism for determining probability of kill based on jamming/maneuvers. Acquisition of a system(s) for either the Dare Country Range or the USN/USMC electronic warfare ranges will likely not occur until FY2025.
	Counterland	●	Same as above.
Scoring & Feedback System	Counterair	●	The 4 FW does not possess any unmanned emitter(s) that can be remotely controlled/operated or that can replicate multiple threats in one system. Additionally, the MTE is not tied into the Live Mission Operations Center to provide real-time feedback on targeting. Threat reactions against a real emitter provides outstanding training; however, without a way to provide feedback to the aircrew on jamming/maneuvers, the effectiveness of those maneuvers is nebulous. Installation of an advanced threat emitter and the associated links to the new Live Mission Operations Center requires a robust network infrastructure. 4 FW is working with HHQ and joint partners to integrate the new Live Mission Operations Center into the USN's robust East Coast Live network. Communications system requirements will likely take two to three years until the 4 FW is fully integrated.
	Counterland	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Land Use	Counterair	●	Plans for multiple wind farms in close proximity to the range will have a moderate impact to training conducted by the 4 FW. The two major impacts involve a degradation to TFR operations and a degradation to the F-15E Air-to-Air Radar when conducting Low Altitude Intercept Training. The wind turbines create clutter on the specific radar displays. This can cause confusion for the aircrew and negatively affect training. In a worst case scenario, the cluttered displays could reduce aircrew awareness of other aircraft traffic and may ultimately impact the safety of the aircrew. The 4 FW is actively engaging with AF Headquarters and all wind turbine proponents to mitigate the impacts of proposed wind turbine farms to the range complex. Rank-ordered options include: a) cancelling the project at the proposed location, b) moving the project a specified safe distance away from the range/MTR, and c) curtailment. This will be an on-going issue with no specific remedy date.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Draughon Assessment Details



Draughton Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	N/A	N/A	N/A	N/A	5.65	7.67	Encroachment Scores	N/A	N/A	N/A	N/A	7.58	7.67
Overall the capabilities assessment value for Draughton Range increased due to implementation of the Gaicho Altitude Reservation (ALTRV), the potential for Gaicho ALTRV to be converted to a Training Reserve Airspace (TRA), the potential expansion of the Draughton TRA, and the introduction and integration of the Joint Deployable Electronic Warfare Range (JDEWR)/Unmanned Threat Emitter (UMTE) Threat system which became operational in January 2017. Scores were also positively impacted by the increased communication with Government of Japan (GoJ), U.S. Forces Japan (USFJ), 5 AF and 3 Airlift Wing (AW) counterparts regarding training impacts, airspace expansion and the future growth way-ahead.							The construction of wind turbines inside the Draughton Range PCA degrades the training capability of Draughton Range and highlights increased encroachment pressures. Therefore, the overall encroachment assessment score decreased. The two 35 FW Fighter Squadrons are assigned the primary role of air-to-air and suppression of enemy air defenses (SEAD). The wind turbine construction encroachment on Draughton Range generated GoJ discussions regarding future growth capability to include, but not limited to, expanding the current Draughton PCA and re-designating ALTRV Gaicho as a TRA to allow bilateral training. The 35 FW does not support the construction of the wind turbines inside the Draughton Range PCA.						

Draughton Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landscape	Strategic Attack	●	Limited landscape cannot support modern weapon danger zones except for a very limited attack axis against non-representative targets for strategic attack. Training is conducted “dry” against simulated targets in off-range areas. No further mitigation is anticipated. The 35 FW is working with USFJ/GOJ Joint Committee to eliminate unnecessary restrictions due to antiquated rules from 1952.
	Counterland	●	Same as above.
	Information Operations	●	The limited land area of the range limits the 35 FW’s ability to distribute threat systems on a scale to mirror today’s realistic enemy electronic order of battle. The emitters on Draughton Range are densely located on a single axis. Misawa AB implementation of the Draughton Bombing Electronic Attack Range (DBEARS) affords the 35 FW some flexibility in placement of enemy ground threat emitters. Re-designating the GAICHO ALTRV to a GAICHO TRA and implementing the Draughton TRA in conjunction with continued GOJ’s approval of the JDEWR electronic spectrum frequencies and bilateral training opportunities with the Japan Ground Self-Defense Force (JGSDF) I-HAWK and Patriot systems will maximize the limited landscape of the current Draughton Range PCA.
	Electronic Combat Support	●	Same as above.
Airspace	Strategic Attack	●	The restricted size and allowed time for use of the restricted airspace and PCA limit the ability to realistically train to for strategic attack and counterland missions. Additional coordination for adjacent airspace is required to effectively utilize the range airspace for these mission areas. Efforts continue to expand the Draughton PCA.
	Counterland	●	Same as above.
	Information Operations	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Air Drop	●	Same as above.
Targets	Strategic Attack	●	The limited range size inhibits the ability to simulate strategic targets on the range. Using Draughton Range by itself does not allow for a large enough distance to train for strategic attack missions. Upgrading the GAICHO ALTRV to a TRA, which is adjacent to Draughton Range and using MOAs, allows for longer and more realistic strategic attack training. Training is conducted “dry” against simulated targets in off-range areas.
	Counterland	●	Same as above.
Threats	Strategic Attack	●	The range continues to increase visual simulation of threat systems. Draughton Range built a simulated SA-2D, SA-2B/F SA-3 SA-6 and AAA formation. The EW visual static targets include SA-2, SA-3 and SA-6 (includes skid mounted, rotating dish, copper coating, green top coat with camouflage pattern).
	Counterland	●	Same as above.
	Air Drop	●	Same as above.
Small Arms Ranges	Counterland	●	A small arms range was built in 2016 and was designed to be used as an overflow range for mass-scale training events. A range operating location for larger weapons such as the 60mm used by Security Forces has not yet been built; however, plans for this type of location have been developed.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Draughton Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Collective Ranges	Strategic Attack	●	The limited range size inhibits the ability to simulate strategic targets on the range. Using Draughton Range by itself does not allow for a large enough distance to train for strategic attack missions. Upgrading the GAICHO ALTRV to a TRA, which is adjacent to Draughton Range and using MOAs allows for longer and more realistic strategic attack training. Training is conducted “dry” against simulated targets in off-range areas.
	Counterland	●	Same as above.
Suite of Ranges	Strategic Attack	●	Strategic attack and counterland operations are primarily limited by airspace, landspace, targets and threats. Coordination for additional airspace is required to conduct strategic attack and counterland operations. Upgrading the GAICHO ALTRV to a TRA, which is adjacent to Draughton Range and using MOAs allows for longer and more realistic strategic attack training. Training for strategic attack and counterland operations is primarily conducted “dry” against simulated targets in off-range areas.
	Counterland	●	Same as above.
	Air Drop	●	The overall air and landspace of Draughton Range limits its ability to support large collective air drop training. Additional airspace is required to accommodate requests to support air drop training on Draughton Range. At this time this is not a priority for the 35 FW.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Strategic Attack	●	Actual restricted airspace is limited and supplemented with a range PCA sanitized by Misawa AB radar approach control facility. Under Host Nation rules, the PCA is available for hazardous activities (laser/weapons transit), but the extent of the PCA is limited due to the proximity of Misawa AB (10 nautical miles south), JGSDF restricted area and commercial air routes. Efforts are underway to extend the PCA with additional volume for limited operating times to accommodate specialized training (exercise close air support [CAS] scenarios and IAM weapons employment). Weapons employment is further restricted by USFJ/GOJ Joint Committee agreement on range restrictions originally established in 1952. Those agreements specify authorized weapons and attack restrictions which do not account for increased weapon capabilities and weapon safety analysis. Efforts are underway to modify the Joint Committee agreement on range restrictions, but Host Nation cultural/social paradigms may be difficult to overcome. Other issues include the siting of commercial wind turbines outside the range proper that interfere with required low altitude training, increased rice planting, and quiet hours due to cultural sensitivities such as rice planting, and primary/secondary educational testing.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Air Drop	●	Same as above.
	Special Operations	●	Same as above.
Climate Impacts	Strategic Attack	●	Costal erosion and flooding has caused downtime to rebuild damaged targets. This occurs approximately every two years. A minor issue occurred in September 2016. The most significant damage was in 2011 during Japan’s tsunami. Coastal changes have caused erosion on the northern portion of the range. 35 FW has conducted dredging of a river to the ocean side as a temporary measure and are looking at using tripods to prevent further erosion.

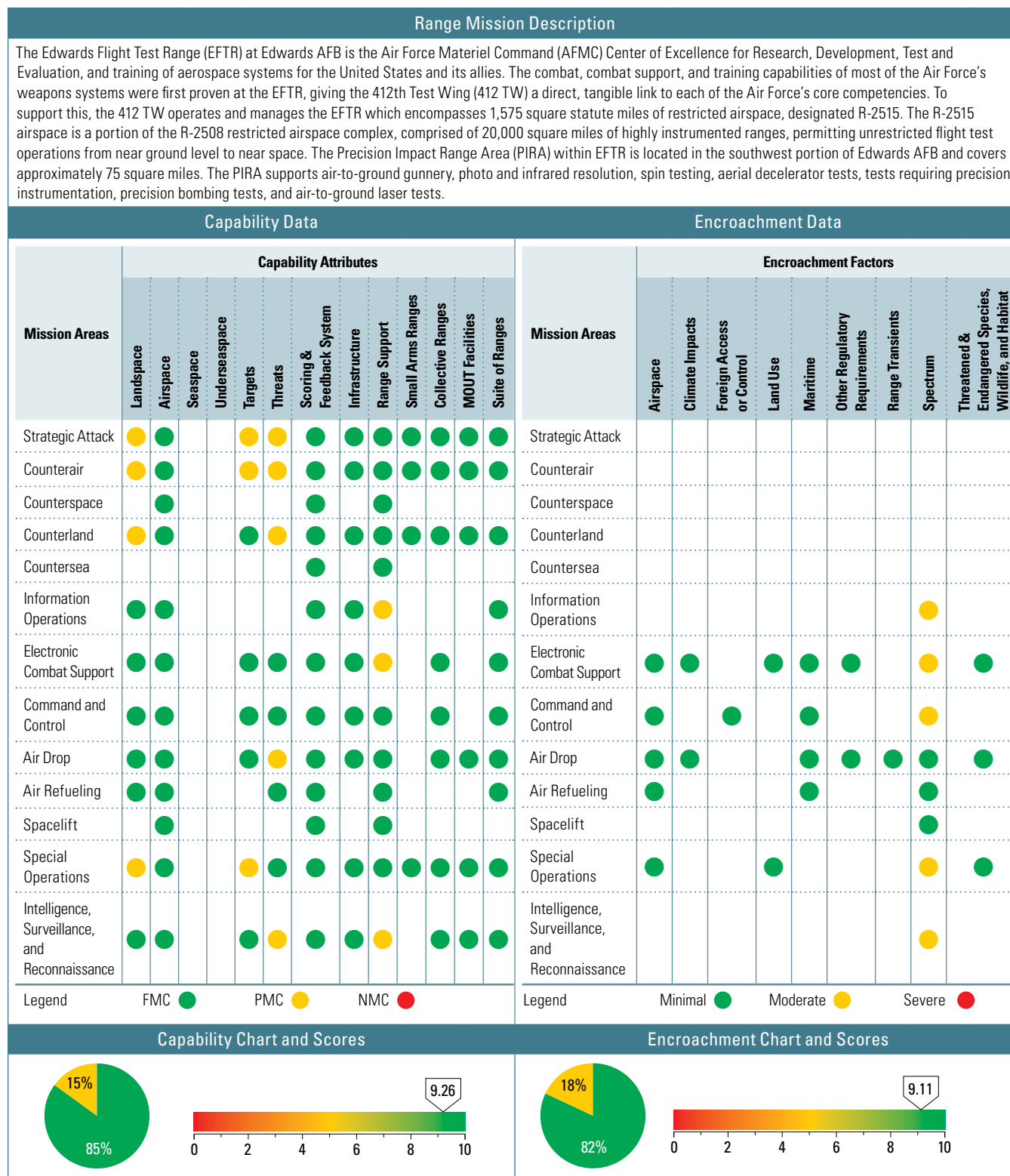
Draughon Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Land Use	Strategic Attack	●	The GoJ is permitting the construction of 82 proposed wind turbines within the range. If the wind turbine construction continues, the 35 FW will lose combat training capability. Specifically, large wind turbines restrict low level ingress routes and adversely affect low altitude combat training. Each year the 35 FW deploys to Alaska to accomplish electronic warfare (EW) training, but now has the capability to accomplish this training on Draughon Range. The 35 FW plans to swap its deployed training focus from EW training to air-to-ground training while in Alaska. Furthermore, the GoJ will prohibit development of all wind turbines and any structure taller than 200' without prior 35 FW coordination. The GoJ also approved an upgrade of Gaicho airspace from ALTRV to TRA to increase the effectiveness of EW training. The range has been sectioned off indicating where wind turbine construction will be opposed, where further coordination is required and where it is allowed. Additionally, the requirement for 35 FW coordination prior to the construction of any structure taller than 200' has been modified and now any construction, regardless of height, requires prior coordination. Other issues include increased rice planting, and quiet hours due to cultural sensitivities such as rice planting, and primary/secondary educational testing.
	Counterland	●	Same as above.
	Information Operations	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Air Drop	●	Same as above.
	Special Operations	●	Same as above.
Range Transients	Strategic Attack	●	Draughon Range includes littoral waters. The use of the range requires sanitization of the littoral waters to ensure the area is clear of transients and fishing boats. There is no additional mitigation planned beyond current observation from additional manned sites on Draughon Range.
	Counterland	●	Same as above.
	Information Operations	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Air Drop	●	Same as above.
	Special Operations	●	Same as above.
Spectrum	Strategic Attack	●	Host nation restrictions require the GoJ MIC to approve all electronic spectrum frequencies used in Japan. Approved waivers are only good for one year. JDEWR requires designated frequency bands to support USAF/JASDF flying operations. The requested band frequencies support the JDEWR threat kits that are required to replicate enemy ground threat systems. Approval of the requested frequency bands allow Misawa AB to execute the 35 FW's primary SEAD/Destruction of Enemy Air Defense (DEAD) missions and affords future joint/bilateral ATR growth capability. Without the approved frequencies, Misawa AB's ability to train against enemy ground threat systems is limited to off-station training at Red Flag-Alaska and GOJ supported ATRs. PACAF and USFJ are trying to secure a five year frequency clearance waiver to operate joint threat emitters in northern Japan to allow for future bilateral and joint training growth.
	Counterland	●	Same as above.
	Information Operations	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Air Drop	●	Same as above.
	Special Operations	●	Same as above.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Edwards Flight Test Range Assessment Details



Edwards Flight Test Range Assessment Details

Summary Observations							Summary Observations						
<p>This assessment addresses the capabilities of the Edwards Flight Test Range (EFTR) and the 412 Range Squadron, Edwards AFB CA in support of the T&E mission. For the purpose of this assessment the EFTR is defined as the airspace within the R-2515 Restricted Airspace above the 301,000 acres of DoD and withdrawn land making up the Edwards AFB Reservation and the range instrumentation array. The entire EFTR is a compilation of capabilities within the 412 Test Wing operating under the AF Test Center (AFTC). It is also important to note that the EFTR does not operate as a stand-alone entity, but as a component of the DoD Southwest Complex which includes EFTR, Ventura County NAS (Pt Mugu), China Lake NAS, Nellis Test and Training Range, Utah Test and Training Range, White Sands Missile Range, and Vandenberg AFB. As such, the complementary capabilities of these ranges allow the EFTR to operate at the fully mission capable level over all T&E mission areas. At this time there are no planned actions to expand the PIRA capabilities to support the training mission. However, planned improvement to the T&E infrastructure may also enhance training activities. Overall, the EFTR is very capable with respect to availability of the suite of ranges, collective ranges, range support, infrastructure, scoring, and airspace. There are potential medium risk concerns associated with landspace in terms of size, targets from a strategic attack and counterair perspective, and threats primarily in the areas of strategic attack, counterair, and intelligence, surveillance and reconnaissance.</p>							<p>Edwards Flight Test Range (EFTR) does not currently have an “assigned training mission”, but is equipped to support training activity. The range is occasionally utilized by tenant commands and other Military Services for proficiency activities to include airdrop and inert weapons release. Encroachment factors such as threatened and endangered species and cultural resources have been previously mitigated and cause minimal impact on the limited training activity that is currently conducted on the EFTR.</p>						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	7.02	7.02	7.02	N/A	8.83	9.31	Encroachment Scores	8.43	8.43	9.25	N/A	8.43	9.38
<p>Urban growth is not a factor currently for the range but expansion of existing and creation of new communities, in addition to continued development in renewable energy projects in the desert, are slowly eroding the usability of Military Training Routes in/around the R2508 complex.</p>							<p>The overall encroachment assessment for training activities have historically remained the same over the last five years with only slight variation (CY 2012-2017). The threat of encroachment on the range has been minimized primarily due to policy and ordinance instituted by the state of California and the three counties bordering the range.</p>						

Edwards Flight Test Range Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Strategic Attack	●	The existing EFTR area can support most types of gravity and precision guided munitions. However, the 412 RANS PIRA landspace is not adequate for the employment of large footprint weapons such as JSOW, SDB, etc. In coordination with our DoD Southwest Range partners, the EFTR participants have the necessary infrastructure to support all aspects of the strategic attack training mission.
	Counterair	●	The existing EFTR area can support most types of counterair training. However, the 412 RANS PIRA space is not adequate for the employment of large footprint air-to-air/ground-to-air weapons such as AIM-9 and AIM-120. In coordination with our DoD Southwest Range partners the EFTR participants have the necessary infrastructure to support all aspects of the counterair training mission.
	Counterland	●	The existing EFTR area can support most types of counterair training. However, the 412 RANS PIRA space is not adequate for the employment of large footprint air-to-air/ground-to-air weapons such as AIM-9 and AIM-120. In coordination with our DoD Southwest Range partners the EFTR participants have the necessary infrastructure to support all aspects of the counterair training mission.
	Special Operations	●	The existing EFTR area can support training of most types of special operations systems. However, the 412 RANS PIRA landspace is not adequate for the employment of large force activities or live fire training of some special operations platforms such as the AC-130. In coordination with our DoD Southwest Range partners the EFTR participants have the necessary infrastructure to support all aspects of the special operations training mission.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)**Edwards Flight Test Range Detailed Comments****Capability Observations**

Attributes	Assigned Training Mission	Score	Comments
Targets	Strategic Attack	●	The 412th RANS has numerous target arrays which can support most aspects of the strategic attack mission area. In addition the range's Command and Control System/facility has the ability to generate airborne and ground threat scenarios and targets for distribution to participants via Link-16 and SADL. Specific target requirements such as hardened bunkers and MOUT facilities are not available, but can be built with test or training customer funding. In coordination with the DoD Southwest Range partners, the EFTR has the necessary infrastructure to support all aspects of the strategic attack training mission.
	Counterair	●	The EFTR cannot support counterair training activities requiring the employment of large footprint air-to-air/ground-to-air weapons such as AIM-9 and AIM-120. In coordination with the DoD Southwest Range partners, the EFTR has the necessary infrastructure to support all aspects of the counterair training mission. Additionally, the range's Command and Control System/facility has the ability to generate airborne and ground threat scenarios for distribution to participants via Link-16 and SADL.
	Special Operations	●	The 412th RANS PIRA has numerous target arrays which can support aspects of the special operations mission area. Specific target requirements such as urban environments and related facilities are not available at the PIRA but can be built with test customer funding. In coordination with our DoD Southwest Range partners the EFTR has the necessary infrastructure to support all aspects of the special operations training mission.
Threats	Strategic Attack	●	The EFTR has the ability to present threat scenarios using ground moving targets such as armor and static airfield configurations with anti-aircraft artillery (AAA) sites. In addition the range's Command and Control System/Facility has the ability to generate airborne and ground threat scenarios for distribution to participants via Link-16 and SADL. The EFTR does not include active threat system such as radars, Smokey SAMS, IR simulators, etc. These assets are available to our programs on a scheduled basis through the 412TW/NAWCWPNS alliance at the Electronic Combat Range at China Lake and from other DoD Southwest Range partners. It is also possible for users to bring mission specific threat systems on range as necessary to meet their training requirements.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Air Drop	●	The EFTR has the ability to present threat scenarios using moving ground targets such as armor and static airfield configurations with AAA sites. In addition the range's Command and Control System/Facility has the ability to generate airborne and ground threat scenarios for distribution to participants via Link-16 and SADL. The EFTR does not include active threat system such as radars, Smokey SAMS, IR simulators, etc. These assets are available to our programs on a scheduled basis through the 412TW/NAWCWPNS alliance at the Electronic Combat Range at China Lake and from other DoD Southwest Range partners. It is also possible for users to bring mission specific threat systems on the 412 RANS PIRA as necessary to meet their training requirements.
	Intelligence, Surveillance and Reconnaissance	●	The EFTR has the ability to present threat scenarios using moving ground targets such as armor and static airfield configurations with AAA sites. In addition the range's Command and Control System/Facility has the ability to generate airborne and ground threat scenarios for distribution to participants via Link-16 and SADL. The EFTR does not include active threat system such as radars, Smokey SAMS, IR simulators, etc.; however, these assets are available on a scheduled basis through the 412TW/NAWCWPNS alliance at the Electronic Combat Range at China Lake and from other DoD Southwest Range partners. It is also possible for users to bring mission specific threat systems on the 412 RANS PIRA as necessary to meet training requirements. EFTR will continue to leverage partnership agreements with other DoD ranges.

Edwards Flight Test Range Detailed Comments

Capability Observations

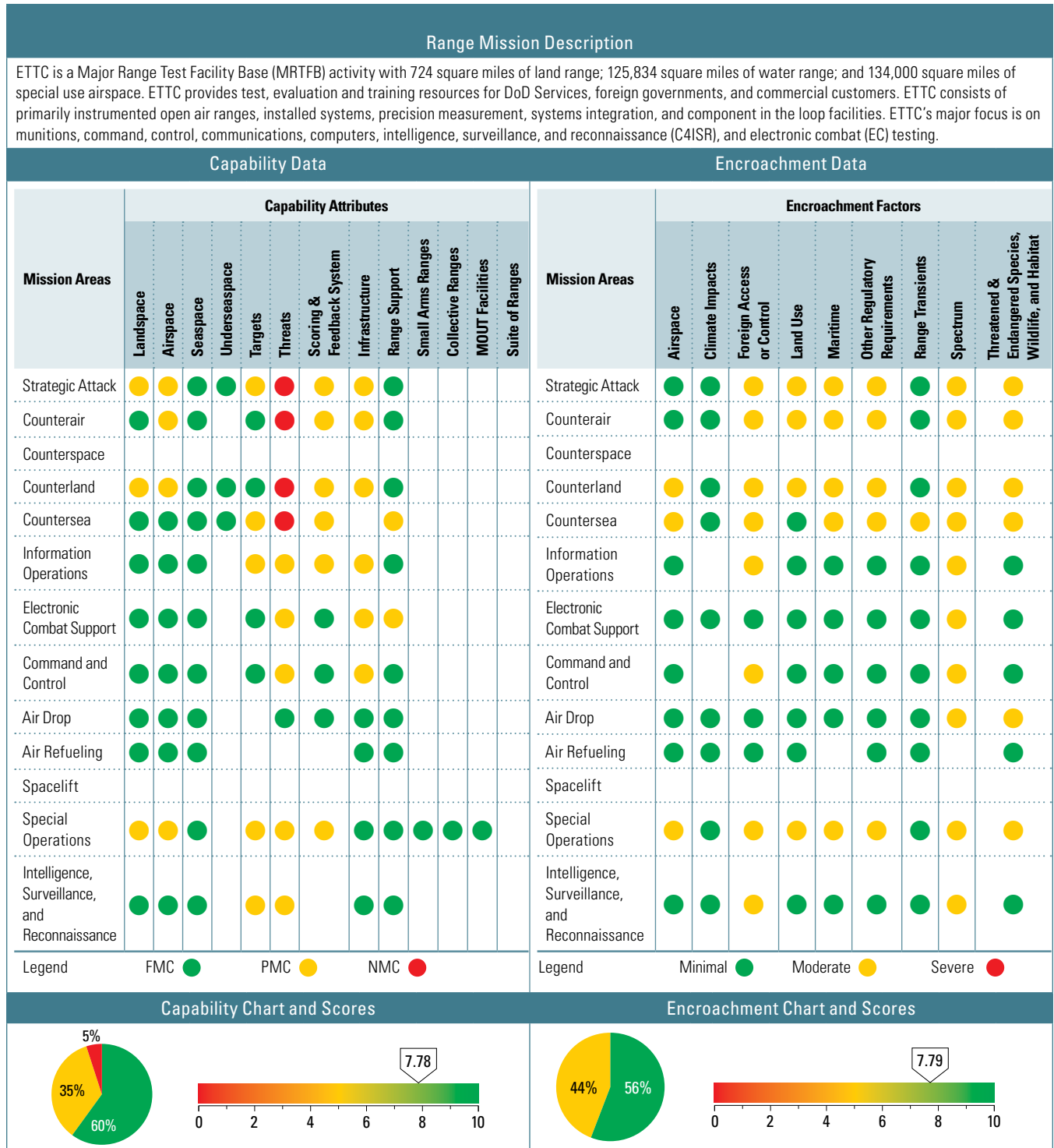
Attributes	Assigned Training Mission	Score	Comments
Range Support	Information Operations	●	The availability of radio frequency (RF) spectrum due to transfer of DoD frequency allocations to the private sector along with impacts to the local noise floor by 802.11 devices may impact the EFTR's ability to support the training of Information Operations (IO)-related systems in a realistic environment. Impacts to frequency are managed through use of different frequency bands and through funding that has been made available to execute the required changes to infrastructure. However, future/pending spectrum auctions and sharing opportunities to meet the Presidential broadband initiative to provide spectrum for broadband use may have additional impacts on range capabilities.
	Electronic Combat Support	●	The 412 RANS does not directly manage and control threat ranges; however, these assets are available to training participants on a scheduled basis through the 412TW/NAWCWPNS alliance at the Electronic Combat Range China Lake. The availability of RF spectrum due to the transfer of DoD frequency allocations to the private sector along with impacts to the local noise floor by 802.11 devices may impact the EFTR's ability to support open air training with EW systems in a realistic environment. Impacts to frequency are managed through use of different frequency bands and through funding that has been made available to execute the required changes to infrastructure. However, future/pending spectrum auctions and sharing opportunities to meet the Presidential broadband initiative to provide spectrum for broadband use may have additional impacts on range capabilities.
	Intelligence, Surveillance and Reconnaissance	●	The availability of RF spectrum due to transfer of DoD frequency allocations to the private sector along with impacts to the local noise floor by 802.11 devices may impact the EFTR's ability to support training with intel-related systems in a realistic environment. Impacts to frequency are managed through use of different frequency bands and through funding that has been made available to execute the required changes to infrastructure. However, future/pending spectrum auctions and sharing opportunities to meet the Presidential broadband initiative to provide spectrum for broadband use may have additional impacts on range capabilities.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Spectrum	Information Operations	●	412 TW has limited spectrum. With future spectrum auctions and requirements to share the spectrum with commercial industry this will impact IO testing. The specific impacts will not be known until those spectrum bands are identified for either auction or sharing.
	Electronic Combat Support	●	412 TW has limited spectrum. With future spectrum auctions and requirements to share the spectrum with commercial industry this will impact Electronic Combat Support testing. The specific impacts will not be known until those spectrum bands are identified for either auction or sharing. The limited spectrum has forced a greater than expected reliance on modeling and simulation. In some instances, testing can be done at night and/or in anechoic chambers that have been modified to support GPS constellations.
	Command and Control	●	412 TW has limited spectrum. With future spectrum auctions and requirements to share the spectrum with commercial industry this will impact Command and Control testing. The specific impacts will not be known until those spectrum bands are identified for either auction or sharing.
	Special Operations	●	412 TW has limited spectrum. With future spectrum auctions and requirements to share the spectrum with commercial industry this will impact Special Operations testing. The specific impacts will not be known until those spectrum bands are identified for either auction or sharing.
	Intelligence, Surveillance and Reconnaissance	●	412 TW has limited spectrum. With future spectrum auctions and requirements to share the spectrum with commercial industry this will impact ISR testing. The specific impacts will not be known until those spectrum bands are identified for either auction or sharing.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Eglin Test and Training Complex (ETTC) Assessment Details



Eglin Test and Training Complex (ETTC) Assessment Details

Summary Observations							Summary Observations						
Strategic Attack, Counterland, and Special Operations are the most affected mission areas because they have many training requirements in common. The primary restrictions are in the threats and infrastructure areas due to the fact that the ETTC is an MRTFB asset and many of its resources are primarily focused on test and evaluation. Most of the threats are based upon test requirements; however, there is a small suite of threats specifically available for special operations training. In general, the BRAC-directed relocation of the 7SFG and establishment of a JSF Training Center at Eglin have significantly increased the overall training assets and infrastructure on the ETTC.							Although the dwindling availability of spectrum is the most pervasive problem facing the test and training community, the internal encroachment of growing operational restrictions from environmental and cultural resource concerns has the most potential for serious constraints on future training capabilities. The overall encroachment score is lower than previous years due to the change in encroachment factors and definitions. The combining of several factors into one new category resulted in previously green categories now being yellow by defaulting the factor to the worst case scenario.						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	8.50	8.50	8.42	8.03	8.07	8.11	Encroachment Scores	8.52	8.52	8.52	8.42	8.49	8.26
Availability of spectrum continues to be a concern and the primary approach to reducing its impact has been to improve frequency management equipment and procedures and to attempt to acquire instrumentation and communication equipment that use less bandwidth or different bandwidths. The Gulf Regional Airspace Strategic Initiative (GRASI) Landscape Planning Initiative will provide a plan to better utilize available SUA by diverting some non-hazardous training activities to nearby State and National forests. This should ease some of the airspace concerns identified in this report; however, this initiative is currently on a strategic hold due to potential to range congestion materializing. Beddown of the Joint Strike Fighter (JSF) training program and significant increases in AFSOC flying activity will probably still stress the airspace capacity of the ETTC in the next 3-5 years. When 7SFG(A) live fire ranges are completed (most are at this time), much of the suite of ranges shortfalls will be resolved, and part of the MOUT facility deficiency will be eliminated. Gulf Range Enhancement (GRE) is an approved USAF program with increments 1 and 2 currently funded starting in FY2019 and running through FY2024. There is an urgent need to move operations from the congested areas in the northern parts of W-151 (water ranges south of Eglin) to less used areas in W-470 (water ranges southeast of Tyndall). The GRE project will provide improved capabilities relevant to the strategic attack, counterair, counterland, countersea, and command and control mission areas.							Spectrum encroachment continues to be a concern. The two primary approaches to reducing its impact have been to improve frequency management equipment and procedures, and to attempt to acquire instrumentation and communication equipment that use less bandwidth or different bandwidths. The GRASI Landscape Planning Initiative will provide a plan to better utilize available SUA by diverting some non-hazardous training activities to nearby State and National forests. AFSOC flying activities are examples of mission encroachment conflict at the ETTC. GRE is an approved USAF program with Increments 1 and 2 currently funded starting in the FY2019 and spread through FY2024. There is an urgent need to move operations from the congested areas in the northern parts of W-151 (water ranges south of Eglin) to less used areas in W-470 (water ranges southeast of Tyndall). Barring any future change in the presumptive balance of U.S. Energy and National Defense policies that currently allow the continued encroachment protections to military use of the Eastern Gulf of Mexico (EGOMEX) via the Congressional Moratorium of the Gulf of Mexico Energy Security Act (GOMESA) of 2006; the forecast for military use of the EGOMEX should remain free of encroachment until 30 June 2022, the scheduled termination date of the GOMESA. Energy (oil/gas/alternative) surface and sub-surface infrastructure (mobile or stationary/permanent) in the EGOMEX are examples of maritime encroachment that is incompatible with military test and training activities including spectrum encroachment. Foreign national involvement in energy-related endeavors in the EGOMEX either solely or corporately with U.S. energy companies creates an opportunity for foreign national intentional, covert monitoring and/or delaying/disrupting of military testing and training in the EGOMEX. The bottom line is that energy (oil/gas/alternative) activities within the EGOMEX are incompatible with existing and forecasted future multi-service military missions. GOMESA or similar legal instruments should endure for as long as the EGOMEX is considered viable for military test and training activities.						

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)**Eglin Test and Training Complex (ETTC) Detailed Comments****Capability Observations**

Attributes	Assigned Training Mission	Score	Comments
Landspace	Strategic Attack	●	There is inadequate landspace to conduct some large footprint weapons training. Some long range standoff weapons currently require flight termination systems or must be released over Eglin's water range. A next generation proposal for a remote impact area in a sparsely populated area near the Florida coast is being reviewed for resubmission. This solution would provide a large water-to-land corridor that would enable the overwater launch and subsequent land impact of almost any long range standoff weapon in development or in the inventory. An anticipated completion date is unknown at this time.
	Counterland	●	Current landspace available to conduct large footprint weapons training has been reduced by the siting of BRAC-directed 7SFG(A) support facilities near the center of Eglin Range. The potential large number of JDAM and GBU drops during JSF training may seriously stress the capacity of air-to-surface impact areas on Eglin. Fewer long range standoff weapons can be dropped over land without flight termination systems, or they must be released over Eglin's water range. The number of desired JSF munitions drops may need to be revised downward, or inert munitions may be dropped over Eglin's water range. An expanded effort is underway to both locate impact areas and identify courses for long range standoff weapons. The desired number of munitions releases during JSF training is currently under review due to a recent request to increase range allocations to support more weapon drops on the range.
	Special Operations	●	Restricted airspace above ground targets will become more congested from the 7th SFG(A) and JSF impact on the MRTFB. Non-hazardous special operations flight training will be restricted to smaller pieces of airspace resulting in less realistic training and missed planned training. The Landscape Planning Initiative will provide some relief however that project is currently on a strategic hold pending outcomes related to potential range congestion materializing.
Airspace	Strategic Attack	●	Integration of the BRAC-directed JSF training activities at Eglin, additional training requirements at Tyndall AFB and Naval Air Station (NAS) Pensacola, expansion of oil/gas drilling, and projected growth in civilian general aviation activities are resulting in increased competition for existing airspace between training, test, and civilian use; while the amount of SUA available for weapons releases is shrinking due to oil/gas drilling in the EGTTT and encroachment on the land. The GRASI provided a macro-level perspective of available airspace and recommended approaches to use it most effectively. One initiative under GRASI is the development of additional Air Traffic Controlled Assigned Airspace (ATCAA) across the Florida panhandle. Updated mission impact analyses concerning oil/gas drilling in the Gulf are provided to OCS on a regular basis. These analyses provide a basis for maintaining the current Military Mission Line and preserving the DoD's ability to test and train in the Gulf. Implementation of most of the GRASI recommendations will be in FY2017.
	Counterair	●	Same as above.
	Counterland	●	Restricted airspace above ground targets will become more congested from the 7th SFG(A) and JSF training on the range. Non-hazardous special operations flight training will be restricted to smaller pieces of airspace resulting in less realistic training and missed planned training. The GRASI Landscape Planning Initiative is looking at the possibility of using other Federal and State lands for many of the non-hazardous training activities that are currently conducted in Eglin's SUA. The initiative will provide some relief however that project is currently on a strategic hold pending outcomes related to potential range congestion materializing.
	Special Operations	●	Same as above.
Targets	Strategic Attack	●	Eglin Range cannot replicate modern strategic threats appropriate for strategic attack. Hard and deeply buried targets are a shortfall area. There is no planned resolution at this time. Foreign targets are insufficient and do not meet the current needs. The range does not have fifth-generation adversary targets (land targets and airborne targets).
	Countersea	●	There are no undersea targets available except those provided by customers for specific programs. Customers must provide their own undersea targets and instrumentation. Land and sea targets are available. There is no planned resolution; customers will continue to supply their own undersea targets. The Gulf Range Expansion effort (Phase 3) will purchase multiple, high speed swarming maritime targets relevant for countersea RDT&E and maritime WSEP.
	Information Operations	●	Same as above.
	Special Operations	●	Target sets available for special operations training are static and unrealistic. These targets do not represent what personnel will encounter during combat operations, resulting in poor reactions to real world situations. There is no planned resolution; customers will continue to supply their own targets.
	Intelligence, Surveillance and Reconnaissance	●	The range lacks EW threat/target relevance for both platform and weapons in the form of multi-spectral, signature representative, mobile targets. The range also lacks instrumented/remote controlled targets to meet target realism requirements for sensor fused weapon systems.

Eglin Test and Training Complex (ETTC) Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Threats	Strategic Attack	●	There are few representative EC emitters available. The range cannot replicate the defenses that would protect a real-world strategic target. The range cannot replicate a realistic IADS set-up because it lacks the cyber component, the space component, and the networking component. This deficiency causes a loss of missions that go elsewhere. SRI has numerous EC emitters, but few are representative of those faced by our forces. The range lacks opposition force (OPFOR) capability and battlefield effects simulators. There is no current program to upgrade existing EC emitters or acquire training threat simulators.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Countersea	●	The Navy, AFSOC, 96 TW, WSEP have requirements to attack at-sea targets; however, the ETTC has a limited ability to execute and monitor countersea shots. These deficiencies will be addressed with Phase 3 of the GRE I&M, better overwater instrumentation, an uber-barge, OWISS, and the OWIL surfboards.
	Information Operations	●	Winning the information duel is crucial to establishing air dominance in today's complex operating environment; emerging technologies integrate EW, kinetic, and Computer Network Operations. For test purposes, instrumented threats and targets need to be replicated in all these domains and measured for effects.
	Electronic Combat Support	●	There is an urgent need to enhance instrumentation capabilities in support of fifth and sixth generation weapons and weapons systems testing and training. Current range instrumentation of the F-35 weapons integration does not have a realistic test environment and a geographically representative real IAD infrastructure (current GRE project does not add threat emitters).
	Command and Control	●	There are no viable threat emitters or simulators for training this mission area. Net-centric weapons and UAS activities require a limited set of emitters/simulators. There is no action planned beyond identifying the minimum set of threats needed in this mission area. Customers will continue to provide their own system-specific threats.
	Special Operations	●	There are few representative EC emitters. SRI has numerous EC emitters, but few are representative of those faced by our forces. The range lacks OPFOR capability and battlefield effects simulators. There is no current program to upgrade existing EC emitters or acquire training threat simulators.
	Intelligence, Surveillance and Reconnaissance	●	There are no viable threat emitters or simulators for this area. Net-centric weapons and UAS activities require a limited set of emitters/simulators. There is no action planned beyond identifying the minimum set of threats needed in this area. Customers will continue to provide their own system-specific threats.
Scoring & Feedback System	Strategic Attack	●	Scoring and feedback systems are inadequate to support certain training and exercise operations. There are no facilities to support training reconstruction or facilities to allow for deployment of large forces into the range, both air or ground; multiple sources of TSPI are currently available but some are not compatible with deployed aircraft. The new Joint Test and Training Operations Control Center (JTTOCC) incorporates numerous tracking capabilities, but not training and exercise mission reconstruction and analysis.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Countersea	●	The Navy, AFSOC, 96 TW, WSEP have requirements to attack at-sea targets. However, the ETTC has a limited ability to execute and monitor countersea shots. These deficiencies will be addressed with Phase 3 (FY2021–FY2024 currently unfunded) of the GRE I&M, better overwater instrumentation, an improved GRATV (more capable instrumentation barge), OWISS, and the OWIL scoring system programs.
	Information Operations	●	Same as above.
	Special Operations	●	Scoring and feedback systems do not exist on most ranges used by AFSOC. Personnel provide their own scoring which can lead to errors. There is no independent record keeping and analysis which prevents Commanders from identifying trends and implementing corrective measures. There is no planned resolution.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Eglin Test and Training Complex (ETTC) Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Infrastructure	Strategic Attack	●	The range currently cannot meet the security requirements of next generation programs (secure facilities/hangars, networks, workforce). Customers are forced to use other ranges, significantly delaying programs or changing requirements to execute missions. The range needs an Exercise Support Facility but is currently unfunded. There is an urgent need to enhance instrumentation capabilities in support of fifth and sixth generation weapons and weapons systems test and training. Current range instrumentation has the following shortfalls: inadequate instrumentation coverage for multi-ship air-to-air and air-surface, to impact, test scenarios; inadequate instrumentation coverage for long range stand-off weapons for mid-course to impact data capture and Flight Termination System coverage; inadequate instrumented range size to allow realistic employment of large footprint weapons and network enabled weapon system employment; and the range cannot support the high data generation rates of new weapons and weapons systems due to current TM capability constraints. Increasing cyber security requirements dictate need for range instrumentation security upgrades. All connections to the Eglin Range Information Grid (ERIG) would need to go through a rigorous cyber security evaluation to make the site compatible with the Risk Management Framework for the ERIG.
	Counterair	●	The range needs T&E infrastructure upgrades to support NexGen testing. The range cannot support the multi-level classification need for the T&E environment. Net-centric warfare requires realistic test environments for systems-of-systems interoperability. See above.
	Counterland	●	Same as above.
	Information Operations	●	Same as above. In addition, the fiber network is insufficient. It needs to improve with regards to geography (extend fiber to additional areas/sites), resiliency (need diverse routes), and capacity (more bandwidth is needed because RDT&E is generating more data per test).
	Electronic Combat Support	●	There are inadequate systems to meet the needs of some training customers. As such there is less than fully effective support for some training customers. There is no funding available for acquiring new systems. May be able to leverage on JSF training needs to obtain some simulators that could be used by other customers as well. Otherwise, customers must bring their own specific emitters/simulators. The cyber-testing of offensive and defensive assets is a 96 TW priority. The ETTC has cybertesting deficiencies that will be addressed through the standup of a Cyber Test Group under the 96 TW and through I&M programs for Multi-Level Security - Joint Collaborative Environment (MLS - JCE), Cyber Defense Test Capability (CDTC), Cyber Test Analysis and Simulation Environment (TASE), Cyberwarfare Assessment Tools (CWAT), Avionics and Weapons Cyber Range Cyberwar Test Capability (CTC), and Test and Evaluation Capability for Integrated Cyber and EW (TECICE).
	Command and Control	●	Same as above. In addition, the fiber network is insufficient. It needs to improve with regards to geography (extend fiber to additional areas/sites), resiliency (need diverse routes), and capacity (more bandwidth is needed because RDT&E is generating more data per test). The control rooms are insufficient and constrain the range's ability to support certain missions. The range needs larger rooms with special access program (SAP) capability.
Range Support	Countersea	●	The Navy, AFSOC, 96 TW, WSEP have requirements to attack at-sea targets. However, the ETTC has a limited ability to execute and monitor countersea shots. These deficiencies will be addressed with Phase 3 (FY2021-FY2024 currently unfunded) of the GRE I&M, better overwater instrumentation, an improved GRATV, OWISS, and the OWIL programs.
	Electronic Combat Support	●	The cyber-testing of offensive and defensive assets is a 96 TW priority. The ETTC has cybertesting deficiencies that will be addressed through the standup of a Cyber Test Group under the 96 TW and through I&M programs for MLS - JCE, CDTC, Cyber TASE, CWAT, Avionics and Weapons Cyber Range CTC, and TECICE.

Eglin Test and Training Complex (ETTC) Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Counterland	●	Increased general aviation traffic in the Part 93 North-South Corridor and placement of the 7SFG(A) cantonment area in the north-central portion of the Eglin Range restrict the capability for cross-range shots, large footprint munitions training, and simultaneous use of east and west range areas for live weapons activity. Some safety profiles have been reengineered to include the new restrictions and some profiles are no longer usable. The GRASI was done to address regional airspace issues. Recommendations from GRASI will be implemented by the end of FY2017 to ensure airspace capability and capacity are not restricted. A follow-up to GRASI is the Landscape Initiative which studies moving non-hazardous training to sites not under restricted airspace, including some nearby State and National Forests; however, implementation of the Landscape Initiative is on a strategic hold due to potential range congestion.
	Countersea	●	Increasing pressures for off-shore oil and gas exploration and production, and increased volume of civilian air traffic over mission areas causes reduced surface area and associated airspace, and reduced availability of existing SUA for countersea training operations. The range plans to work with EGTTT users to ensure updated Mission Impact Analyses are provided to the DoD lead for mission compatibility analysis on the Outer Continental Shelf (OCS). It is imperative that the Military Mission Line and restrictions for surface OCS development be maintained to enable future training operations in the EGTTT. A follow-up to GRASI is the Landscape Initiative which is studying moving non-hazardous training to sites not under restricted airspace, including some nearby State and National Forests; however, implementation of the Landscape Initiative is on a strategic hold due to potential range congestion.
	Special Operations	●	Same as above.
Foreign Access or Control	Strategic Attack	●	There is the potential for foreign encroachment in the EGOMEX. Using limited public information sources, 96 TW monitors non-US energy stakeholders interests in the US oil and gas industry. At the federal government level, the Committee on Foreign Investment in the United States (CFIUS) is an inter-agency committee of the United States Government that reviews the national security implications of foreign investments in U.S. companies or operations. Communications with Headquarters U.S. Air Force (HAF) during CY2015-CY2016 confirmed their responsibilities. Specifically, surface and/or sub-surface oil and gas infrastructure encroachment in the eastern Gulf of Mexico (GOMEX) are incompatible with the daily, multi-service, military test and training activities in the EGOMEX. Public Law 109-432, and specifically the language of the GOMESA of 2006, prohibits oil and gas leasing, pre-leasing or related activities east of the Military Mission Line (MML) in the EGOMEX. This Congressional Moratorium prohibition remains in force until 30 June 2022. Non-U.S. ownership, investment, or operations of oil and gas infrastructure by foreign governments or U.S. companies with foreign partners, could unknowingly allow intentional, covert collection of sensitive test data and/or disrupt/delay sensitive test missions. If the energy policy of the United States eventually allows such 'foreign' oil and gas activities in the EGOMEX, restrictions should include the requirement to ensure DoD review and approval, prior to installation, of any electronic equipment capable of receiving or transmitting electromagnetic signals with the potential to adversely affect military test missions.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Countersea	●	Same as above.
	Information Operations	●	Same as above.
	Command and Control	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance and Reconnaissance	●	Same as above.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)**Eglin Test and Training Complex (ETTC) Detailed Comments****Encroachment Observations**

Factors	Assigned Training Mission	Score	Comments
Land Use	Strategic Attack	●	The range has limited water-to-land flight corridors for armed weapons systems. This reduces the flexibility of making realistic water-to-land transitions with armed weapons systems or allowing water-to-land transitions by long range standoff weapons. Potential land acquisitions and cooperative efforts with other agencies to obtain overflight privileges are useful in increasing the width of the water-to-land corridors. A "Next Generation" proposal for a remote impact area in a sparsely populated area near the Florida coast is being reviewed for resubmission. This solution would provide a large water-to-land corridor that would enable the overwater launch and subsequent land impact of almost any long range standoff weapon in development or in the inventory. An anticipated date for resolution is unknown since review is still in an informal phase
	Counterair	●	Same as above.
	Counterland	●	Urban sprawl, land use conversion from agriculture to residential, and new transportation corridors (on and off Eglin) all restrict training. Development around the range leads to a host of secondary encroachment concerns including tall structures, more EM-emitting devices, additional noise-sensitive receptors, pressure on protected species, etc. The push for use of more renewable energy sources has resulted in a solar farm proposal near the eastern boundary of the land range, and there is increased use of small wind energy systems in the areas surrounding Eglin. These can restrict future military operations on periphery of the range, and interfere with flight operations and data transmission from test and training missions. Buffering the adjacent land from urban development yields many long-term encroachment benefits. Eglin has developed REPI projects to acquire property rights on adjoining private property, including a multi-million dollar effort to preserve the Nokuse Plantation (a REPI Challenge-winning project). Eglin has worked with the surrounding community to address land use concerns through the Joint Land Use Study, Air Installation Compatible Use Zone (AICUZ), Small Area Studies, Installation Complex Encroachment Management Action Plan (ICEMAP), and through continual coordination at the municipal planning level. The surrounding cities and counties frequently work with Eglin on issues of concern; and have changed their Comprehensive Plans, Land Development Codes, and other relevant ordinances to encourage military compatibility. A well-structured range planning process is in place where Mission Impact Analyses are performed on proposals brought forward by the cities/counties.
	Countersea	●	Same as above.
	Special Operations	●	Urban development in the Navarre area is an encroachment concern for the AFSOC training on AC-130s on the ETTC air-to-ground ranges at A-77 and A-78. The gunship training (primarily done at night) creates noise that can be heard in the community.
Maritime	Strategic Attack	●	Encroachment from oil and gas activities, restrictions on the use of certain high explosives, and increased volume of civilian boating activities in the EGOMEX pose significant limitations to strategic attack training. Oil and gas activities with surface and sub-surface infrastructure would reduce the area available to test and train with large footprint weapons; restrictions of certain types of high explosive munitions limits the type of training that could be accomplished; and increased civilian boat traffic requires time-consuming clearance activities for large footprint weapons tests. 96 TW will work with EGOMEX users to ensure updated Mission Impact Analyses are provided to the DoD lead for mission compatibility analysis on the OCS. It is imperative that compliance with the aforementioned Public Law 109-432 be maintained and endure beyond its termination date to enable future training operations in the EGOMEX. 96 TW will continue to work with the local Natural Resource Section to develop mitigations and procedures to minimize the impact of marine mammal considerations on training capabilities in the EGOMEX. 96 TW range clearance procedures are reviewed frequently and provide the most efficient process for clearing required areas of the EGOMEX. Anticipated date for a final solution is unknown.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Countersea	●	Same as above.
	Special Operations	●	Same as above.

Eglin Test and Training Complex (ETTC) Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Other Regulatory Requirements	Strategic Attack	●	Restrictions on the training mission arise from the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), and other regulations; as well as local agreements made in consultation with the Florida State Historic Preservation Officer (SHPO). The Integrated Cultural Resources Management Plan (ICRMP) indicates that approximately 205,336 acres within the Eglin installation are identified as high probability for containing cultural resources and recommended for archaeological survey. These “high probability” areas (determined by a computer model) have restrictions on their training use until they are surveyed. The range will continue to develop Mission Impact Analyses that consider the mission impact of proposed cultural resource restrictions. The range will rewrite the local range instruction to better define the roles of the Range Operating Authority with respect to reviewing, coordinating, and approving these new restrictions before they are provided to outside coordination agencies and are levied on training units. Eglin Civil Engineering has developed an environmental restriction tool which is available for use by TW planners to aid customers with their mission needs while complying with existing cultural resources restrictions. An anticipated date for a final solution is unknown.
	Counterair	●	Same as above.
	Counterland	●	There are known and suspected cultural resource sites along the coast, in the interior of the range, and along rivers and streams. This encroachment impedes the use of the range by training units and adds costs and time to the planning side. Littoral and riverine, ingress/egress training operations are restricted to several small and somewhat uncharacteristic areas along the coasts and streams. The Range Operating Authority (ROA) must continue to develop Mission Impact Analyses that consider the serious mission impact of some of these new restrictions. The range will rewrite the local range instruction to better define the roles of the ROA with respect to reviewing, coordinating, and approving these new restrictions before they are provided to outside coordination agencies and are levied on training units. The ROA must work with the Cultural Resources office during AF Form 813 review to identify available training sites and to determine what restrictions apply to the preferred sites. Eglin Civil Engineering has developed an environmental restriction tool which is available for use by TW planners to aid customers with their mission needs while complying with existing cultural resources restrictions. An anticipated date for a final solution is unknown. There are land use restrictions in and around wetlands. Wetland restrictions affect munitions usage, target placement, and digging, and vehicle usage. The Eglin INRMP states that 65,350 acres of range land are considered wetlands. The buffers maintained around these wetlands further adds to the acreage (approximately 87,736 acres total) that is encumbered by wetland encroachment. Eglin also follows State of Florida regulations on the use/management of wetlands, adding another layer of regulatory burden. In addition, Significant Botanical Sites (SBS), as well as larger-scale landscapes containing complexes of High Quality Natural Communities and rare species are singled-out for special restrictions. Combined, these High Quality Natural Communities and SBSs total 111,314 acres. Therefore, wetlands, High Quality Natural Communities, and SBSs constrict activities on approximately 200,000 acres of the 443,000-acre range land (almost half the available land surface). The ROA must work with the Natural Resources Section during AF Form 813 review to identify available training sites and to determine what restrictions apply to the preferred sites. An environmental restriction tool has been created by Eglin Civil Engineering and is available to TW planners to aid them in meeting their training mission needs while complying with Eglin's natural and cultural resource restrictions. An anticipated date for a final solution is unknown.
	Countersea	●	There are limitations on operations due to gulf sturgeon critical habitat along the coast, in Choctawhatchee Bay, and in adjacent rivers; the presence of marine mammals along the coast and in the bays; and a proposal to establish Marine Protected Areas (MPA) or National Monuments in the northern Gulf of Mexico. These limiting factors have the potential to significantly impact Eglin's training mission. They restrict certain operations over the EGTTR, including those that were designed/intended for countersea operations. The planned action is to continue to work with regulatory agencies and the Natural Resource Office to develop mitigations and procedures for threatened and endangered species that are practical and consistent with the military training mission; and to provide mission impact analysis to decision makers concerning proposed MPAs and other proposed mission restrictions. An anticipated date for a final outcome is unknown.
	Special Operations	●	Same as above.
Range Transients	Countersea	●	Eglin controls airspace above the Gulf of Mexico, but does not control the surface of the water. This lack of control causes safety issues and requires additional money and time to work around this situation by hiring civilian boats to warn non-participating parties and ask them to stay out of the hazard area. The Coast Guard, Destin Station, also provides assistance with clearing hazard areas in the Gulf. Eglin sometimes uses an E-9A aircraft to ensure the hazard area is clear of non-participating parties, though there have been issues with cost and aircraft availability. The overwater ranges also have issues with civilian aircraft periodically infringing on this airspace and causing negative effects on mission activities. The range will continue providing notices to airmen and mariners about scheduled activity in the Gulf.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)**Eglin Test and Training Complex (ETTC) Detailed Comments****Encroachment Observations**

Factors	Assigned Training Mission	Score	Comments
Spectrum	Strategic Attack	●	The EM spectrum needed for operations suffers from interference and the total amount desired is unavailable. There are constraints placed on customers due to unavailability of, or interference with, required electromagnetic spectrum. The Federal Communications Commission (FCC) plans to auction 500 MHz of federal spectrum over the next ten years, which will cause additional encroachment and EM problems. All frequencies shall be scheduled for de-confliction to prevent interference/conflicts among users. Eglin has a Frequency Control and Analysis function with both fixed and mobile assets that find conflicting signal sources that need to be shut down. Eglin is in the process of installing three additional fixed passive radio frequency antenna sites which will aid in finding conflicting signals. Two of these sites are currently planned but unfunded. Eglin has also done extensive upgrades and is continuing to purchase newer radios and equipment that have tighter control of their emissions (narrower bands) and have shifted to less used frequency bands. The range also actively works on EM shielding and noise attenuation to limit impacts to/from equipment. An anticipated date for a final solution for overall is unknown.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Countersea	●	Same as above.
	Information Operations	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Command and Control	●	Same as above.
	Air Drop	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance and Reconnaissance	●	Same as above.

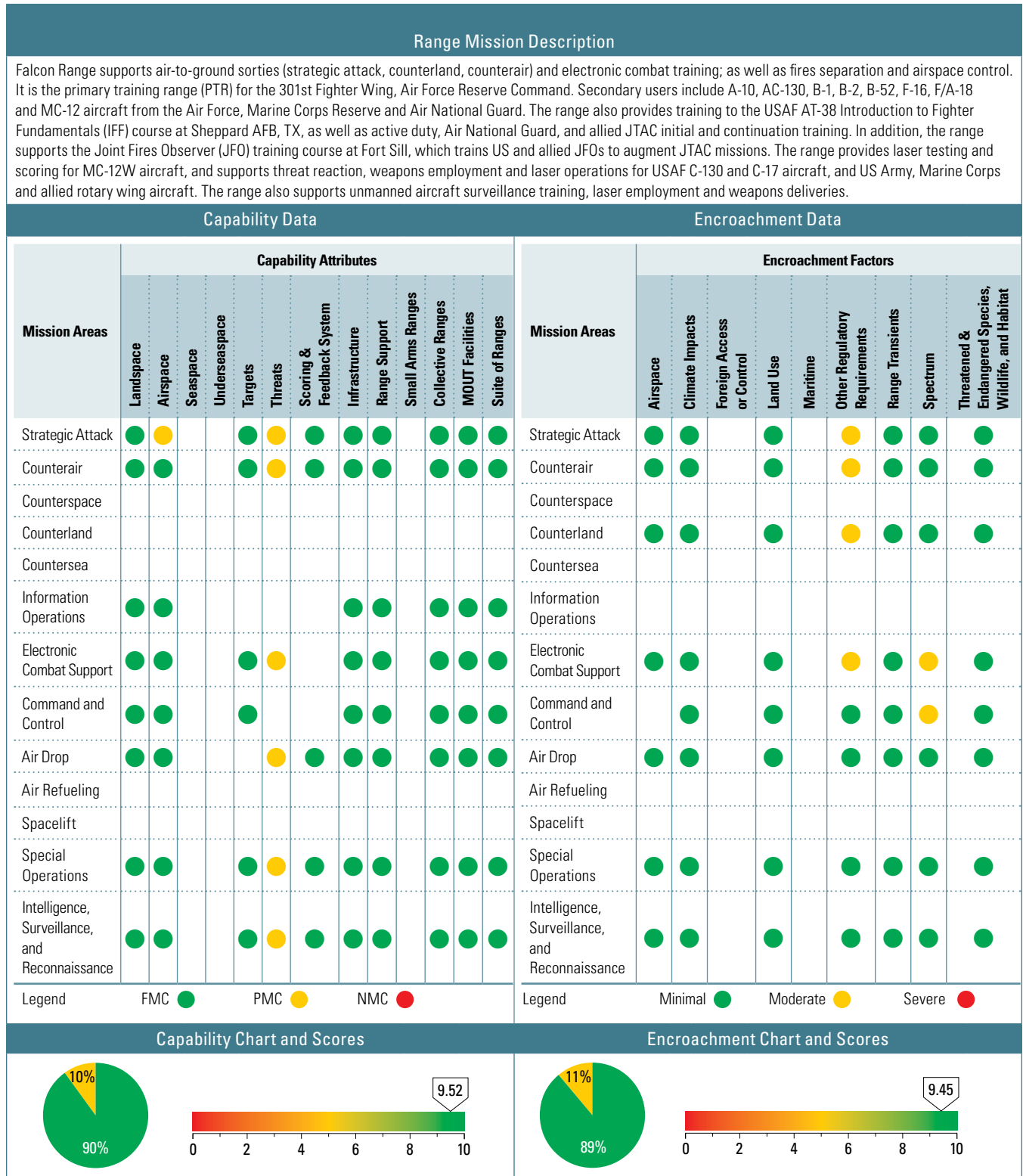
Eglin Test and Training Complex (ETTC) Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Threatened & Endangered Species, Wildlife, and Habitat	Strategic Attack	●	The Endangered Species Act (ESA) listings of red-cockaded woodpeckers (RCW), Okaloosa darters, flatwoods salamanders, sea turtles, Piping plover, and the Gulf sturgeon and their associated habitat over the years has resulted in various restrictions being imposed on the range's training capability. These restrictions have reduced the use of some land areas and littoral/riverine areas from using certain land vehicles, conducting various troop movements, employment of certain munitions, and placement of targets for training mission activities. Eglin's current INRMP indicates there are approximately 17,000 acres of range land that is potential habitat for Flatwoods Salamanders. Using the model in the INRMP approximately 128,000 acres of Eglin is designated RCW foraging habitat, and Piping plover, bog frog, indigo snake, and gopher tortoise areas and habitat (including High Quality Natural Communities) combine to place many more acres of restrictions/mitigations over much of the range land (approximately 264,524 acres of the 442,878-acre ETTC land area). The planned action is to continue to work with the Natural Resources Office (NRO) to develop procedures to enhance training capability while protecting threatened and endangered (T&E) species and their associated habitat improvements/restoration in areas that have the least impact on training operations/capabilities. The Eglin Natural Resource Office has long been recognized as a leader in the DoD for its proactive approach to management of Eglin's natural resources. Efforts have focused on habitat improvements/restoration that should increase T&E species populations; which should allow greater flexibility for training operations in the future. Balancing judicious protection of training resources/capabilities with protection of T&E species and their habitats is a continuing management process that requires the support of all range stakeholders.
	Counterair	●	Same as above.
	Counterland	●	As noted above, the existence of RCW, Okaloosa darters, Flatwoods salamanders, gopher tortoises, indigo snake, marine mammals, and various sea turtles (the primary local endangered/threatened/protected species), and designated critical habitat for certain shorebirds on Santa Rosa Island and the gulf sturgeon along shorelines and adjacent rivers/streams restrict the use of some land areas and littoral/riverine areas for the use of some aircraft, munitions, and targets; as well as land/water training maneuvers. The planned action is to continue to work with local NRO to develop mitigations and procedures to minimize the impact of T&E considerations on training capabilities. It is not so much that the areas are restricted to use as it is that there are certain terms and conditions that have to be met in order to use these areas. Some of the restrictions/mitigations incur costs to the training unit, some restrict certain types of training activities, and some incur delays during the consultation process. An anticipated date for an acceptable final outcome is unknown.
	Countersea	●	Limitations on operations due to gulf sturgeon critical habitat along the coast, in Choctawhatchee Bay, and in adjacent rivers; the presence of marine mammals along the coast and in the bays; and a proposal to establish MPAs or Monuments in the northern Gulf of Mexico have the potential to significantly impact Eglin's training mission. These restrict certain operations over the EGTR, including those that were designed/intended for countersea operations. The planned action is to continue to work with regulatory agencies and the NRO to develop mitigations and procedures for T&E species that are practical and consistent with the military training mission and to provide mission impact analysis to decision makers concerning proposed MPAs and other proposed mission restrictions. An anticipated date for a final outcome is unknown.
	Air Drop	●	Same as above.
	Special Operations	●	Encroachment arises from the ESA, Marine Mammal Protection Act, Migratory Bird Treaty Act, National Environmental Policy Act and other regulatory drivers. Limitations on operations due to gulf sturgeon critical habitat along the coast, in the bay, and in adjacent rivers; certain species of mussels recently listed under the ESA; the presence of marine mammals along the coast and in the bays; and a proposal to establish MPAs or Monuments in the northern Gulf of Mexico have the potential to significantly impact Eglin's training mission. Restrictions due to sea turtle nesting and seasonal shorebird presence on Santa Rosa Island places operational conditions on operations on the island and on littoral areas, including those that were designed/intended for special operations. This places conditional restrictions on operations along the coast and bay areas. The planned action is to provide mission impact analysis to decision makers concerning future proposals and to continue to work with Eglin NRO office to develop mitigations and procedures that minimize the impact of protected species considerations on training capabilities. There are specific terms and conditions that have been negotiated between NRO and the regulators that have to be met in order to use these areas. Some of the terms and conditions incur costs to the training unit (financial, manpower, and time), place operational conditions on certain types of training activities, reduce training realism, and some can incur delays due to the consultation process when needed. The goal is to conduct training mission activities while protecting natural resources and reduce costs or extended coordination cycles to the fullest extent possible.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Falcon Assessment Details



Falcon Assessment Details

Summary Observations							Summary Observations						
<p>The range has improved its infrastructure since 2004 with multiple scoring systems. Falcon Range provides aircrews with two urban areas, one of which is laser-scoring capable, and one of which supports both lasers and kinetic weapon employment. Three electronic warfare threat simulators are available; however, they are not transponder or skin-paint tracking systems, but visual-only or fixed-site emitters, with no real feedback mechanism, so they offer limited capability. Realistic self-consuming man-portable air defense system (MANPAD) simulators provide additional threat reaction training while making a very minimal impact on the environment. The MANPAD simulators do not require explosive ordnance disposal (EOD) support and leave no residue. The range has on-site EOD support, so the range is not closed for extended periods for EOD cleanup. Targets are realistic and range from large buildings to small anti-aircraft guns and mannequins. Several unmanned moving targets, which can follow either a pre-programmed route or can be manually controlled as the scenario dictates, allow the full-scale delivery of weapons against a moving target, as well as combat laser employment. There are two laser scoring systems, one of which has mobile capability, one laser designation system, and two kinetic scoring systems available. The primary constraint for the range is the size of the impact area, which was reduced in FY2016 by 1200 acres to allow joint training on the ground. It limits the employment of some laser-guided and most inertially-aided munitions due to weapons danger zone (WDZ) restrictions. The Army prohibits the intrusion of any WDZ outside the range areas with a containment or risk of greater than 1:1,000,000. Several doctrinally-accepted weapons deliveries are restricted due to WDZs extending outside the range. The reduced impact area has significantly improved training opportunities for ground personnel, such as JTAC. Strategic attack is most affected by the range's size; however, there are very few strategic attack missions (less than two percent of annual sorties). The range also works extensively with Fort Sill environmental agencies and has helped restore old dump areas to their original state.</p>							<p>The range is part of the Fort Sill range complex. Encroachment is minimal, although there are a number of nearby wind farms that, if expanded, may eventually encroach upon low-level airspace leading into the range. The Army is currently involved in the purchase of adjoining land in order to provide a larger buffer zone as part of a JLUS and a larger restricted airspace went into effect 2 March 2017. This airspace allows use of unmanned aircraft within restricted areas. There are no environmental or cultural resource shortfalls at the range. External spectrum encroachment is minimal, although there are restrictions placed on the employment of electronic countermeasures, both hard (chaff) and soft (jamming) due to nearby radars. Weapons/ordnance deliveries are restricted due to the Army's requirement to ensure weapons containment and the lack of available landspace on one border caused by the adjoining National Wildlife Refuge.</p>						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	6.88	6.88	10.00	9.79	9.79	9.51	Encroachment Scores	9.77	9.77	10.00	10.00	10.00	9.68
<p>Falcon Range has excellent capabilities for a range of its size, although future employment has some limitations. These limitations are not unique to Falcon Range. As inertially-aided weapons are developed and fielded, the WDZs for some weapons parameters prove to be larger than the range boundaries. The range is limited to 1:1,000,000 risk values to manned sites by Army Regulation 385-63. Pending airspace upgrades will allow the range to better serve customers with improved airspace for maneuver and laser employment. The range has excellent laser scoring and designation capability and all personnel are highly trained in laser operations. The addition of multiple moving targets allow aircrews to actively fire lasers at a moving target and deliver munitions against a moving target array, a capability not found at most other ranges. This capability becomes more critical as weapons such as the laser JDAM are developed, and as lead-computing impact point software is employed. The 301st Fighter Wing and the Major Command (MAJCOM) are seeking an upgraded radar threat emitter which will offer significant improvement over the current suite of visually-tracked emitters.</p>							<p>There are no historical issues at Falcon Range for encroachment. The range has not been adversely affected by encroachment; in fact, the range has benefitted from the upgrades at Fort Sill as a result of BRAC 2005. Cultural sites on the range are well clear of any target areas and are set aside from the target arrays in order to preserve their integrity; Fort Sill has an active trust program. The existence of the Wichita Mountains Wildlife Refuge to the north and Fort Sill to the east precludes development nearby, although there are corresponding constraints for some weapons deliveries. The nearest wind farms are 17 miles northeast and are outside of low-altitude airspace. Spectrum issues remain significant, due to nearby civilian and military radar sites, although the actual impact on training is minimal. It is not likely that the spectrum restrictions will be lifted in the near future. As the WDZ Tool continues to improve as a result of improved data, restrictions placed on the use of inertially-aided munitions may lessen in the future. Currently there are some weapons/parameters combinations that cannot be performed due to the Army's requirement to contain weapons with better than 1:1,000,000 risk values. The actual impact on the ability to employ inertially-aided munitions is minimal because their employment can be easily simulated. Recent airspace initiatives (R-5601G and H) became effective in 2017 which increased the airspace available for the employment of lasers and maneuver of aircraft. Additionally, the deactivation of a FORSCOM artillery battalion at Fort Sill allows more opportunities to utilize airspace normally allotted for artillery.</p>						

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)**Falcon Detailed Comments****Capability Observations**

Attributes	Assigned Training Mission	Score	Comments
Airspace	Strategic Attack	●	The airspace is not sufficient for bomber-type aircraft without coordination. Aircraft are restricted to altitudes which are not always doctrinally relevant. An agreement between host base and FAA allows bomber aircraft to use existing adjacent special use airspace with 24-hour coordination. Short-notice requests may be denied.
Threats	Strategic Attack	●	The range's electronic warfare threat simulators are limited to visual acquisition, limiting the ability of the operator to acquire and track the target aircraft. Threats replicated are older systems. Threat reaction feedback to operators of the systems is very limited. Most countermeasures are not only prohibited in the airspace, but would have no effect on the systems. Therefore, aircrews do not receive feedback regarding threat reactions. More advanced and relevant training systems for threat replication are needed.
	Counterair	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Air Drop	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance, and Reconnaissance	●	Same as above.

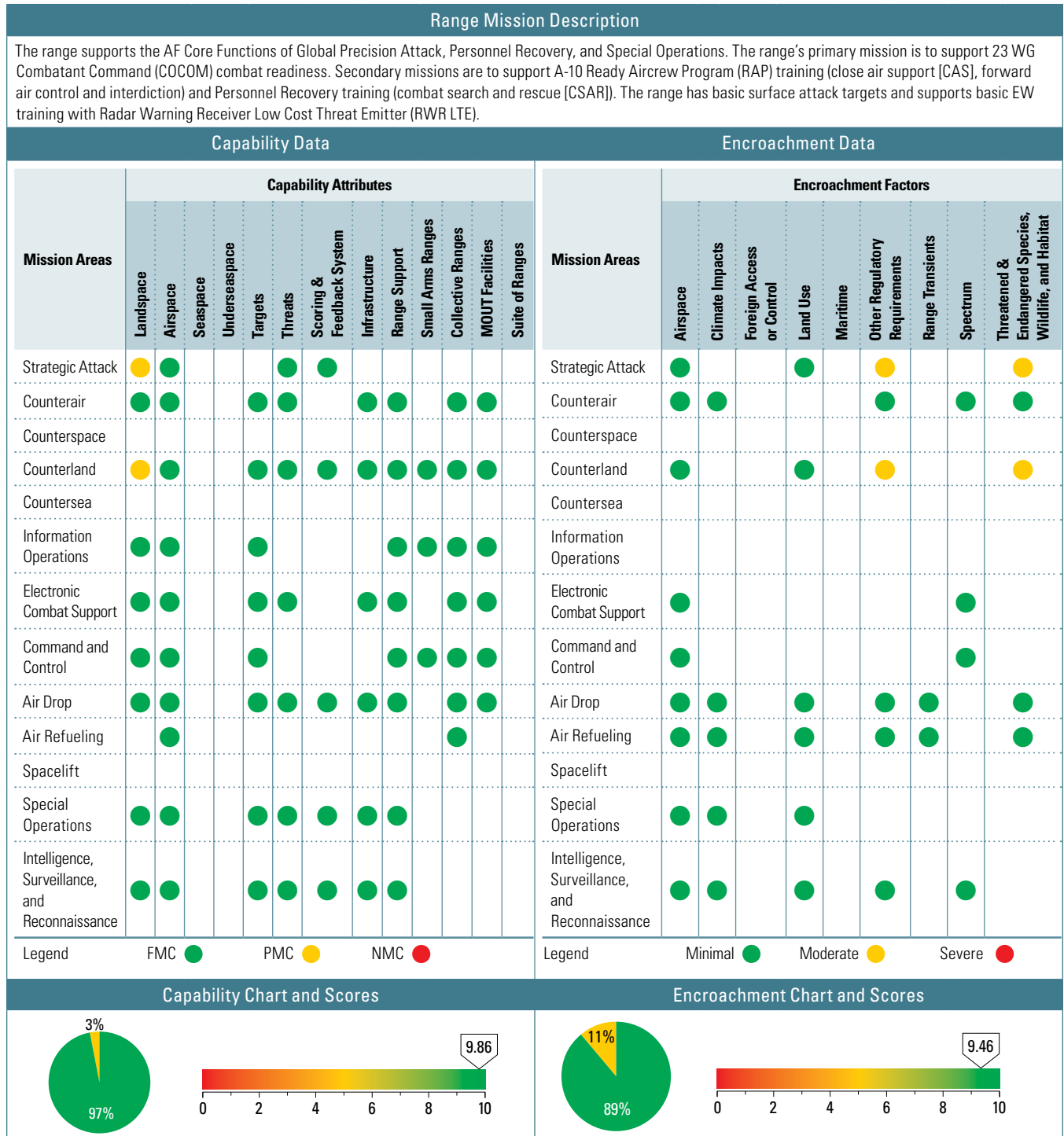
Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Other Regulatory Requirements	Strategic Attack	●	There are restricted weapons delivery parameters or denial of certain weapons deliveries due to WDZ impingement upon adjacent military ground training areas. Effect on training is minimal. The agreement with the host base allows USAF to schedule the adjacent training areas in advance if the areas are required. This requires users to forecast in advance their requirements; short-notice requests may be denied if training areas are occupied.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.
Spectrum	Electronic Combat Support	●	There are restrictions associated with use of the electromagnetic spectrum which constrains certain training events such as chaff employment. The effect on training is minimal. The range will continue to operate within limitations in accordance with FAA and USAF agreements.
	Command and Control	●	Same as above.

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Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Grand Bay Assessment Details



Grand Bay Assessment Details

Summary Observations							Summary Observations						
The main area of concern is the lack of accessible landscape to support training events associated with the 23 WG. In many cases, there is an “either or” approach to scheduling of training events due to the relatively small size of Grand Bay Range. There are a few of the newer PGM that cannot be employed on the range due to the size of their WDW and the limited size of the range itself. Large force ground maneuvers cannot be conducted due to range size as well as NEPA/Wildlife protection based wetland/habitat restrictions on the range. Ground force small arms weapons fire training events are being supported by Grand Bay Range, but firing fans are limited due to range size. Air-to-ground training munitions events supported by the range meet most aircrew training requirements but firing fans and final attack headings are again limited in some cases due to range size and the limited size of the restricted area airspace (R-3008).							The main area of concern is the lack of accessible landscape to support some training associated with the 23 WG. In many cases, there is an “either or” approach to scheduling of training events due to the relatively small size of Grand Bay Range and a significant number of environmentally sensitive areas (wetlands and habitat). Large force ground maneuvers cannot be supported due to range size and wetland/habitat restrictions on the range. Ground force munitions training events are supported by Grand Bay Range, but firing fans for some munitions are also limited due to range size and the presence of sensitive areas. Newer federal floodplain assessment and designation further restricts use of available land for target or training area development without further federal agency review.						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	9.58	9.58	9.68	9.91	9.91	9.71	Encroachment Scores	9.49	9.49	9.85	9.92	9.92	9.86
No major changes in capabilities are projected for Grand Bay Range. Small score changes are due to in-house re-assessment of current training events being performed on the range and scheduling adaptations, or other small adjustments made in an effort to use Grand Bay Range more efficiently or expand its training utility. Long-term projections will depend on the future of airframes/units based at Moody AFB and mission readiness training requirements. At this time, CSAR training requirements have not drastically changed after the beddown of the HC-130J. The CRH (HH-60 replacement) program is in its infancy and future training requirements have yet to be defined. Future projections also hinge on plans for the A-10 and A-29 platforms and USAF leadership decisions regarding future aircraft basing. Grand Bay Range supports some small arms weapons firing events as required for base assigned pararescue jumper and Security Force personnel; however, increasing the size of the restricted area (R-3008) airspace as well as acquiring more land adjacent to the range would increase the capability to support simultaneous training events and allow expansion of final attack headings and firing fans.							No major changes in encroachment are projected for Grand Bay Range. However, vigilance and community involvement is still required because of possible development of farmland and forested areas adjacent to or near the range and underneath current flight patterns. The small encroachment score changes for this report are due to in-house re-assessment based on training missions being performed on the range, existing range use and scheduling adaptations, or other small adjustments made in an effort to use Grand Bay Range more efficiently or expand its training utility. Long-term projections depend on the future of airframes/units based at Moody AFB and mission readiness training requirements. At this time, CSAR training requirements have not drastically changed after the beddown of the HC-130J. The CRH (HH-60 replacement) program is in its infancy and future training requirements have yet to be defined. Future projections also hinge on plans for the A-10 and A-29 platforms and USAF leadership decisions regarding future aircraft basing.						

Grand Bay Detailed Comments

Capability Observations

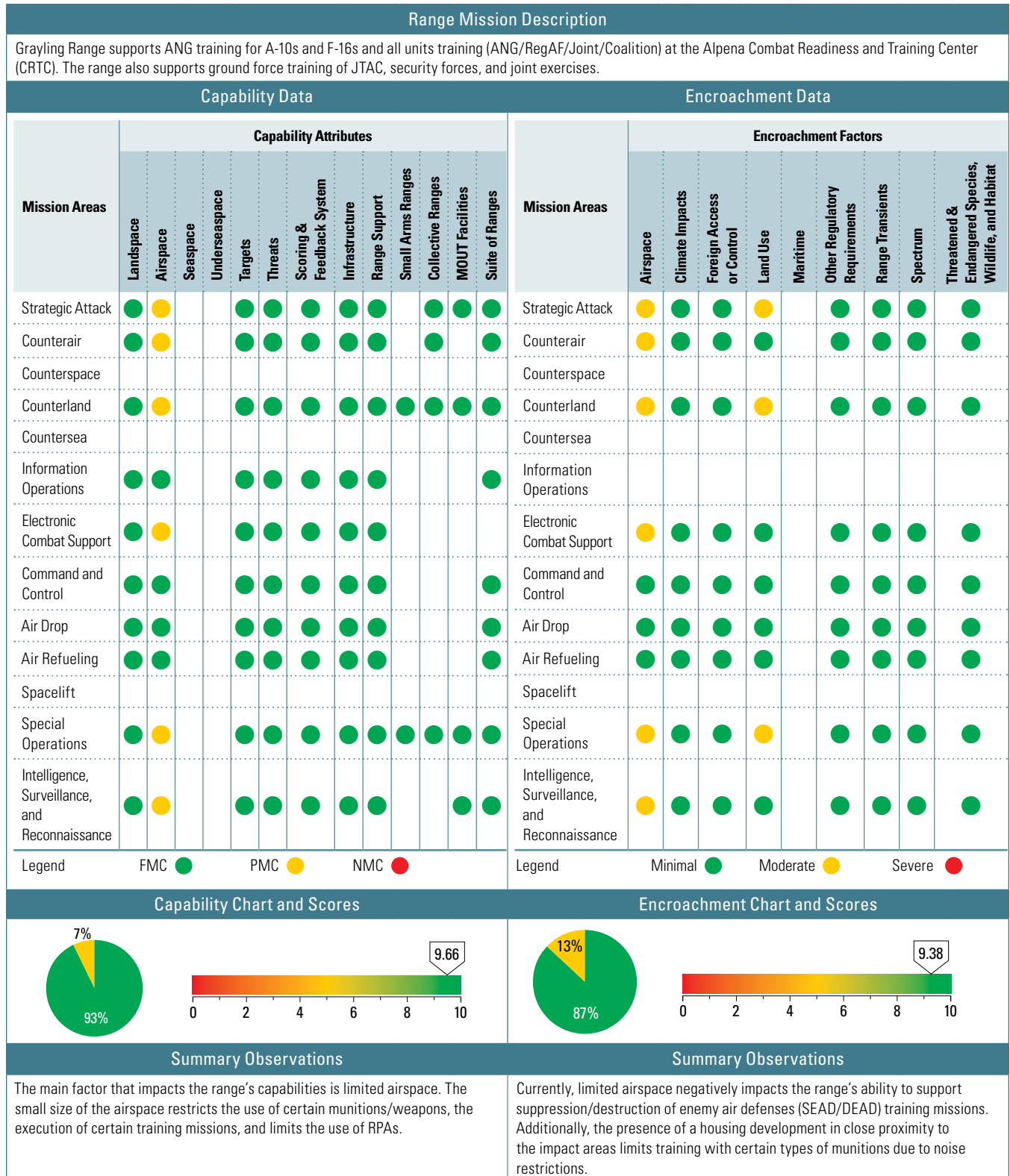
Attributes	Assigned Training Mission	Score	Comments
Landscape	Strategic Attack	●	There is a lack of landscape which challenges the range’s ability to support some target arrays and danger zone containment for a few munitions. There are also regulatory restrictions due to the presence of environmentally sensitive areas (wetlands and habitat) that limit land use. These issues will be addressed in the next update to the comprehensive range plan.
	Counterland	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Other Regulatory Requirements	Strategic Attack	●	There is a lack of landscape and also regulatory restrictions due to the presence of wetlands that limit land use. There are no planned actions, except to submit required environmental documents for review when necessary when there are changes to mission readiness training.
	Counterland	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Strategic Attack	●	There is a lack of landscape and also regulatory restrictions due to the presence of environmentally sensitive areas (habitat) that limit land use. There are no planned actions, except to submit required environmental documents for review when necessary when there are changes to mission readiness training.
	Counterland	●	Same as above.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Grayling Assessment Details



Grayling Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	9.39	9.39	9.44	9.44	9.44	9.83	Encroachment Scores	9.49	9.49	9.49	9.49	9.49	9.49
The range's capabilities have been relatively stable over the last several years and are not expected to significantly change in the near future.							Encroachment scores have been relatively stable for the range over the last several years and are not expected to significantly change in the near future.						

Grayling Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Airspace	Strategic Attack	●	Airspace is limited in size (only 99 square NM) based on older aircraft and their capabilities. Employment tactics for current critical weapons systems such as laser-guided bombs (LGB) and IAM are very limited. An airspace action to create adjacent MOA is in progress with expected completion in 2020.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Airspace is limited in size (only 99 square NM) based on older aircraft and their capabilities. Employment tactics for SEAD missions against the JTE are very limited; aircrews are unable to fly appropriate geometries. An airspace action to create adjacent MOA is in progress with expected completion in 2020.
	Special Operations	●	Airspace is limited in size (only 99 square NM) based on older aircraft and their capabilities. JTACs and pilots are unable to use current employment tactics for current critical weapons systems such as LGBs and IAMs. An airspace action to create adjacent MOA is in progress with expected completion in 2020.
	Intelligence, Surveillance, and Reconnaissance	●	Airspace is limited in size (only 99 square NM) and a section has a limited in ceiling (9,000 ft) based on older aircraft and their capabilities. RPA are effectively excluded from a third of the restricted airspace due to the low ceiling, reducing available targets and topography for training. An airspace action to increase the ceiling to 23,000 ft is in progress with expected completion in 2020.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Strategic Attack	●	Currently, the airspace is limited in size (only 99 square nautical miles [NM]) based on older aircraft and their capabilities. Employment tactics for current critical weapons systems such as LGBs and IAMs are very limited. An airspace action to create adjacent military operating area (MOA) is in progress with expected completion in 2020.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Currently the airspace is limited in size (only 99 square NM) based on older aircraft and their capabilities. Employment tactics for SEAD/DEAD missions against the JTE are very limited; aircrews are unable to fly appropriate geometries. An airspace action to create adjacent MOA is in progress with expected completion in 2020.
	Special Operations	●	Currently the airspace is limited in size (only 99 square NM) based on older aircraft and their capabilities. JTACs and pilots are unable to use current employment tactics for current critical weapons systems such as LGBs and IAMs. An airspace action to create adjacent MOA is in progress with expected completion in 2020.
	Intelligence, Surveillance and Reconnaissance	●	Currently the airspace is limited in size (only 99 square NM) based on older aircraft and their capabilities. JTACs and pilots are unable to use current employment tactics for current critical weapons systems such as LGBs and IAMs. An airspace action to create adjacent MOA is in progress with expected completion in 2020.
Land Use	Strategic Attack	●	A housing area of over 50 homes is located within the restricted area and is also within 2 NM of impact areas; the housing association makes frequent noise complaints. Squadrons are limited in the volume of live (high-explosive) munitions allowed in a year and may not use ordnance greater than Mk-82 class (500lb). Currently there is no plan to resolve this problem.
	Counterland	●	A housing area of over 50 homes is located within the restricted area and is also within two NM of impact areas; the housing association makes frequent noise complaints. A noise sensitive area (1,500 ft. above, 1/4 mile lateral offset) prevents aircraft from using 90 of 360 degrees of attack headings during low altitude attacks reducing training value of both interdiction and close air support missions. Squadrons are limited in volume of live (high-explosive) munitions allowed in a year and may not use ordnance greater than Mk-82 class (500lb). Currently there is no plan to resolve this problem.
	Special Operations	●	Same as above.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Hardwood Assessment Details

Range Mission Description																							
Hardwood Range supports daily air-to-ground sorties, air-to-air sorties and electronic combat training. The range also supports training for an assortment of other US air/ground crew during major exercises and units at Volk Field Combat Training and Readiness Center (CRTC).																							
Capability Data													Encroachment Data										
Mission Areas	Capability Attributes												Mission Areas	Encroachment Factors									
	Landspace	Airspace	Seaspace	Underseaspace	Targets	Threats	Scoring & Feedback System	Infrastructure	Range Support	Small Arms Ranges	Collective Ranges	MOUT Facilities		Suite of Ranges	Airspace	Climate Impacts	Foreign Access or Control	Land Use	Maritime	Other Regulatory Requirements	Range Transients	Spectrum	Threatened & Endangered Species, Wildlife, and Habitat
Strategic Attack	Yellow	Green			Green	Green	Green	Green	Green	Green				Strategic Attack	Green	Green	Green	Green		Yellow	Green	Green	Green
Counterair		Green			Green	Green	Green	Green	Green					Counterair	Green	Green	Green	Green		Green	Green	Green	Green
Counterspace														Counterspace									
Counterland	Yellow	Green			Green	Green	Green	Green	Green	Green				Counterland	Green	Green	Green	Green		Yellow	Green	Green	Green
Countersea														Countersea									
Information Operations														Information Operations									
Electronic Combat Support	Green	Green			Green	Green	Green	Green	Green					Electronic Combat Support	Green	Green	Green	Green		Green	Green	Green	Green
Command and Control	Green	Green			Green	Green	Green	Green	Green	Green				Command and Control	Green	Green	Green	Green		Green	Green	Green	Green
Air Drop	Green	Green			Green	Green	Green	Green	Green					Air Drop	Green	Green	Green	Green		Green	Green	Green	Green
Air Refueling		Green							Green					Air Refueling	Green	Green	Green	Green		Green	Green	Green	Green
Spacelift														Spacelift									
Special Operations	Green	Green			Green	Green	Green	Green	Green	Green				Special Operations	Green	Green	Green	Green		Green	Green	Green	Green
Intelligence, Surveillance, and Reconnaissance	Green	Green			Green	Green	Green	Green	Green	Green				Intelligence, Surveillance, and Reconnaissance	Green	Green	Green	Green		Green	Green	Green	Green
Legend	FMC Green PMC Yellow NMC Red												Legend	Minimal Green Moderate Yellow Severe Red									
Capability Chart and Scores													Encroachment Chart and Scores										
<div><div><div>3%</div><div>97%</div></div><div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div>9.84</div></div>													<div><div><div>3%</div><div>97%</div></div><div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div>9.86</div></div>										
Summary Observations													Summary Observations										
Landspace is impacting users employment of actual PGM. To comply with Air Force Instructions, aircraft delivery parameters are restricted. These restrictions place significant limitations on full, realistic/tactical employment of these types of munitions.													Wetlands within Hardwood Range significantly impact military mission operations by limiting the placement of targets, developing new target areas, and range/fire break maintenance. Acreage is limited to a two mile by six mile area. Additionally, WDZs must remain within range boundaries; Limited range space coupled with larger WDZs required for PGM and wetlands related restrictions further limits how/where targets are placed. Restrictions/limitations effect local unit training by marginalizing training standards/conditions.										

Hardwood Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	9.17	9.17	9.50	9.53	9.53	9.66	Encroachment Scores	8.99	8.99	9.09	9.24	9.24	9.24
Overall, capabilities at Hardwood Range have been improving. Airspace surrounding the range/MOA has been increased/modified to meet training requirements. Improvements to existing threats/emitters have been made and infrastructure and real property improvements continue to keep the range relevant and ready to meet emerging requirements. Additionally, improved accuracy in the assessment have contributed to the overall capability scores.							Hardwood Range's encroachment pressures have been improving. While there is no perimeter fence around the impact area, unauthorized presence of individuals impacting missions has decreased. The addition of informational kiosks combined with updated public use procedures have increased public awareness, reducing unauthorized range access. Access gates have been improved and will continue to improve. Fencing will be added where required/feasible. There has not been an increase in the local population and one is not expected. Cranberry farms on south/east border provide buffer. State owned land to north and wildland refuge to west further assist with keeping local population expansion to minimum/nonexistent. In 2015, the airspace initiative was implemented, greatly improving the range's ability to support the majority of mission areas. Wetlands, coupled with acreage limitations, continue to degrade the range's ability to provide users realistic employment of PGM. Scheduled wetland delineation (summer 2017) will determine the range's ability to improve and or degrade training opportunities in the future.						

Hardwood Detailed Comments

Capability Observations

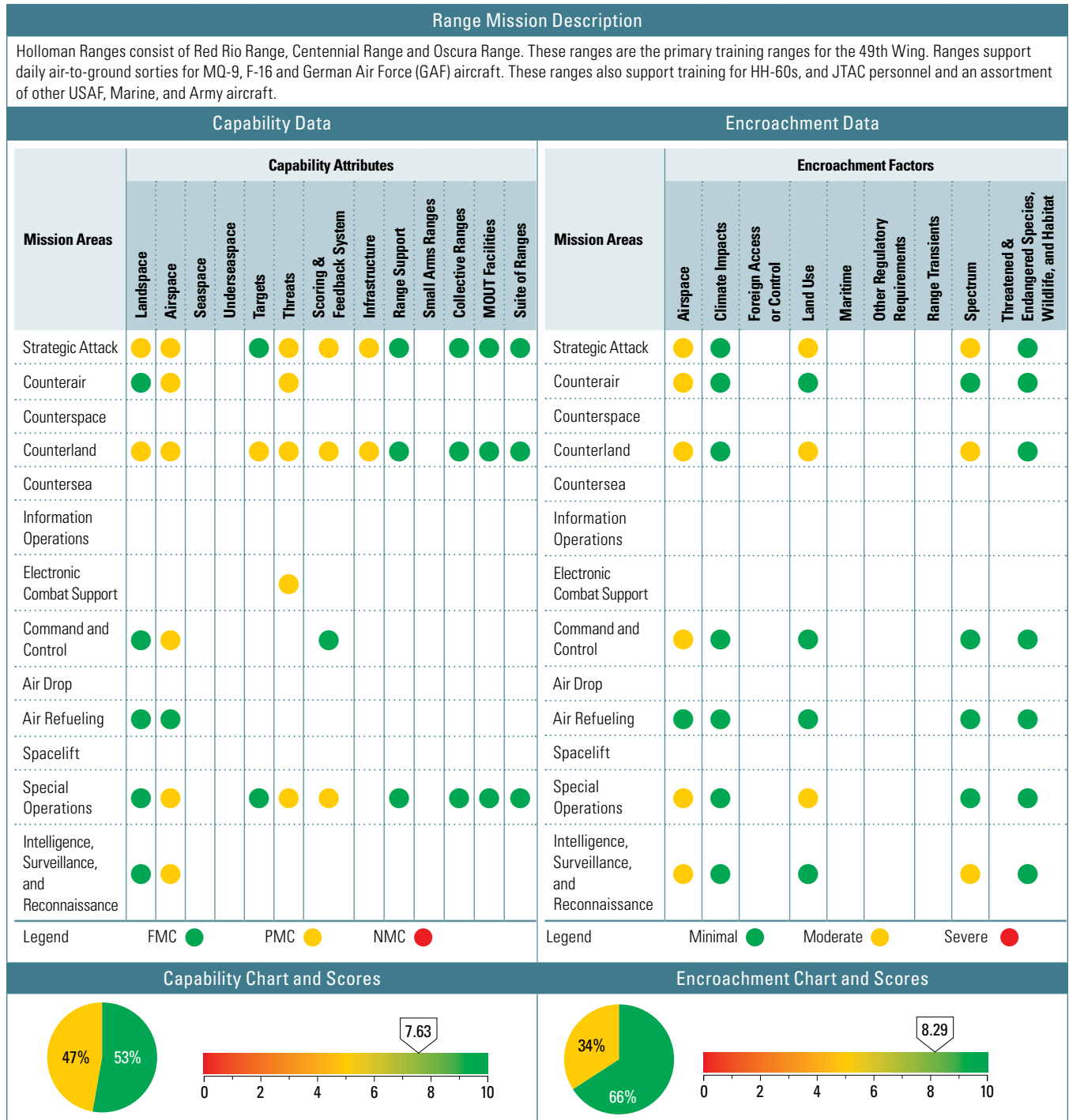
Attributes	Assigned Training Mission	Score	Comments
Landscape	Strategic Attack	●	The impact area is inadequate for full-envelope employment of inert PGM. To comply with WDZ restrictions, footprints must remain within range boundaries. Footprints are adjusted to comply with AF instructions; however, this limits aircraft employment of LGBs and IAMs to very specific employment parameters. There is no plan to expand range landspace at this time.
	Counterland	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Other Regulatory Requirements	Strategic Attack	●	The range's landspace includes wetlands. Wetland restrictions inhibit the range's ability to construct complete firebreaks, place new targets, and develop new target areas. The range is working with Civil Engineering and will undergo complete wetland delineation summer of 2017.
	Counterland	●	Same as above.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Holloman Assessment Details



Holloman Assessment Details

Summary Observations							Summary Observations						
There are four key issues that affect the capability of the Holloman Range's: All three AF ranges are physically located on US Army land, White Sands Missile Range (WSMR) and Ft Bliss, which requires daily coordination and deconfliction of Air Force activities with Army testing and training; The ranges have no threats or moving targets for enhanced dynamic training; Ranges are in remote locations with no access to the power grid, necessitating use of solar power which requires constant battery management and maintenance; and AGM114 Hellfire missiles cannot be employed on any of the ranges because the WDC footprint is too large.							The primary encroachment issue at all three ranges is that they are physically located on US Army lands, Ft Bliss, and WSMR. Air Force training needs are the lowest priority for Army schedulers/planners and require daily coordination and deconfliction with Army testing and training.						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	8.04	8.04	9.41	9.41	9.41	9.08	Encroachment Scores	8.42	8.42	10.00	9.88	9.88	8.96
The four issues described in the Summary Observations have affected range operations since the ranges were created. The ranges' training tempo is expected to increase with the addition of two F-16 training squadrons in the near future. The increased training tempo will exacerbate the need for enhanced, dynamic targets and threats, which in turn, will increase the demand on the power infrastructure. There is a plan to reposition threat emitters on the ranges. Additionally, there is a plan to add a moving target to the ranges, but this effort is still unfunded.							The primary encroachment issue for all three ranges is being physically located on Army land which has been a factor since the ranges were created in the 1940's. This issue is not expected to change until agreements are reached with WSMR and Ft Bliss to increase the priority of Air Force training.						

Holloman Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landscape	Strategic Attack	●	The AGM114 footprint exceeds range boundaries and RPAs cannot train with AGM114 as a result. This limitation is mitigated by using the M-36 Captive Flight Trainer.
	Counterland	●	Same as above.
Airspace	Strategic Attack	●	Air Force training is the lowest priority in Army airspace (Ft Bliss/WSMR) resulting in limited access to the airspace required for training missions. Daily coordination/deconfliction with scheduling agencies and constant scheduling fluctuations all impact the ability to conduct AF training missions.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Command and Control	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance, and Reconnaissance	●	Same as above.
Targets	Counterland	●	The range has no moving targets which limits the type of training the range can support. A moving target for the range has been added to Air Combat Command's unfunded requirements list.
Threats	Strategic Attack	●	The range has no threat emitters which limits the type of training the range can support. The requirement for three unmanned mobile threat emitters has been approved.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Special Operations	●	Same as above.
Scoring & Feedback System	Strategic Attack	●	There is no electrical power on Red Rio/Centennial and access is only by gravel roads. This impacts range support (scoring) and causes significant wear and tear on vehicles. Wind and solar power could be used. Currently there is no plan to upgrade the roads due to budget constraints.
	Counterland	●	Same as above.
	Special Operations	●	Same as above.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)**Holloman Detailed Comments****Capability Observations**

Attributes	Assigned Training Mission	Score	Comments
Infrastructure	Strategic Attack	●	There is no electrical power on Red Rio/Centennial and access is only by gravel roads. This impacts range support (scoring) and causes significant wear and tear on vehicles. Wind and solar power could be used. Currently there is no plan to upgrade the roads due to budget constraints.
	Counterland	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Strategic Attack	●	Air Force training is the lowest priority in Army airspace (Ft Bliss/WSMR) resulting in limited access to the airspace required for training missions. Daily coordination/deconfliction with scheduling agencies and constant scheduling fluctuations all impact the ability to conduct AF training missions.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Command and Control	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance, and Reconnaissance	●	Same as above.
Land Use	Strategic Attack	●	Army training requirements have increased adjacent to Centennial Range/airspace. There has been a significant reduction of AF training/flying areas within the Ft Bliss complex. Daily coordination with using entities is required.
	Counterland	●	Same as above.
	Special Operations	●	Same as above.
Spectrum	Strategic Attack	●	GPS jamming conflicts with RPA operations airspace. RPAs may be unable to conduct syllabus training during jamming periods. Daily coordination with testing units reduces the impact.
	Counterland	●	Same as above.
	Intelligence, Surveillance, and Reconnaissance	●	Same as above.

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Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Jefferson Assessment Details

Range Mission Description																							
The Indiana Range Complex is a grouping of geographically supportive training facilities comprised of Atterbury Range, Jefferson Range, and the Muscatatuck Center for Complex Operations. Of the three, Atterbury and Jefferson are operated by the Air National Guard. Jefferson Range provides primary training for several units and joint training for large-force employment (LFE), Marine expeditionary units (MEU), special operations forces (SOF), SMERF, the Federal Emergency Management Agency (FEMA), Air Support Operations Squadrons (ASOS), irregular warfare (IW), urban warfare, and homeland defense all in conjunction with the Muskatatuck Urban Warfare Training Center (MUTC).																							
Capability Data							Encroachment Data																
Mission Areas	Capability Attributes												Mission Areas	Encroachment Factors									
	Landspace	Airspace	Seaspace	Underspace	Targets	Threats	Scoring & Feedback System	Infrastructure	Range Support	Small Arms Ranges	Collective Ranges	MOUT Facilities		Suite of Ranges	Airspace	Climate Impacts	Foreign Access or Control	Land Use	Maritime	Other Regulatory Requirements	Range Transients	Spectrum	Threatened & Endangered Species, Wildlife, and Habitat
Strategic Attack	●	●			●	●	●	●	●	●	●	●	●	Strategic Attack	●	●		●		●	●	●	●
Counterair		●			●	●	●	●	●			●		Counterair	●	●				●	●	●	●
Counterspace														Counterspace									
Counterland	●	●			●	●	●	●	●	●	●	●	●	Counterland	●	●		●		●	●		●
Countersea														Countersea									
Information Operations	●				●		●	●				●	●	Information Operations		●		●		●		●	●
Electronic Combat Support	●				●	●	●	●	●			●	●	Electronic Combat Support	●	●		●		●	●	●	●
Command and Control	●	●			●	●	●	●	●			●	●	Command and Control	●	●		●		●		●	●
Air Drop	●	●			●	●	●	●	●	●	●	●	●	Air Drop	●	●		●		●	●	●	●
Air Refueling		●				●		●	●					Air Refueling	●	●					●		●
Spacelift														Spacelift									
Special Operations	●	●			●	●	●	●	●	●	●	●	●	Special Operations	●	●		●		●	●	●	●
Intelligence, Surveillance, and Reconnaissance	●	●			●	●	●	●	●			●	●	Intelligence, Surveillance, and Reconnaissance	●	●		●		●	●	●	●
Legend	FMC ● PMC ● NMC ●												Legend	Minimal ● Moderate ● Severe ●									
Capability Chart and Scores							Encroachment Chart and Scores																
<div><div><div></div><div>14%</div><div>86%</div></div><div><div></div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div><div>9.32</div></div></div>							<div><div><div></div><div>19%</div><div>81%</div></div><div><div></div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div><div>9.05</div></div></div>																
Summary Observations							Summary Observations																
UXO contamination somewhat limits Jefferson Range's placement of targets and maneuver areas. Clearance of the UXO during annual residue removal is opening new areas for small arms training and target placement, and retrieval of RPA and air drops; however, further expansion and development is prohibitive under the current budget.							The impact area is saturated with UXO residue, which limits the ability to conduct certain activities on the range. The range also has several protected species surrounding the impact areas. Lastly, the current environmental assessment is limited by the noise study which restricts both airspace usage and the use of future weapon systems.																

Jefferson Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	8.75	8.75	9.14	8.97	8.97	9.02	Encroachment Scores	8.66	8.66	8.71	8.46	8.46	8.49
Overall capabilities at the range complex have increased by the annual clearance of UXO; however, it is a very slow process due to the limitations of the EOD assets and the total amount of UXO that are present in impact areas. The range infrastructure has expanded and become more robust allowing for greater training capability.							Overall capabilities at the range complex have increased by the annual clearance of UXOs; however, it is a very slow process due to the limitations of the EOD assets and the total amount of UXO that are present in impact areas.						

Jefferson Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Counterland	●	The range has approximately 1,100 acres for the development of target arrays under the current permit and memorandum of understanding (MOU) but it is contaminated with UXO. Target arrays cannot be developed in these areas due to the UXO contamination which restricts training capability. The plan is to continue the removal of UXOs during annual clearances and other times as the budget allows.
	Special Operations	●	Same as above.
Targets	Strategic Attack	●	The range has approximately 1,100 acres for the development of target arrays under the current permit and MOU but it is contaminated with UXO. Target arrays cannot be developed in these areas due to the UXO contamination which restricts training capability. The plan is to continue the removal of UXO during annual clearances and other times as the budget allows.
	Counterland	●	Same as above.
	Air Drop	●	There is a high volume of UXO in impact areas. Additional target arrays cannot be constructed restricting training capability. The plan is to continue the removal of UXOs during annual clearances and other times as the budget allows.
	Special Operations	●	Same as above.
	Intelligence, Surveillance and Reconnaissance	●	Same as above.
Scoring & Feedback System	Counterair	●	The range does not have equipment to provide exercise planning or debriefing for training events. Range users must travel to locations that offer a VTC capability or have minimal planning for training events. Installation of VTC equipment that provides this capability and secure VTC would mitigate this issue.
	Information Operations	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Command and Control	●	Same as above.
	Intelligence, Surveillance, and Reconnaissance	●	Same as above.

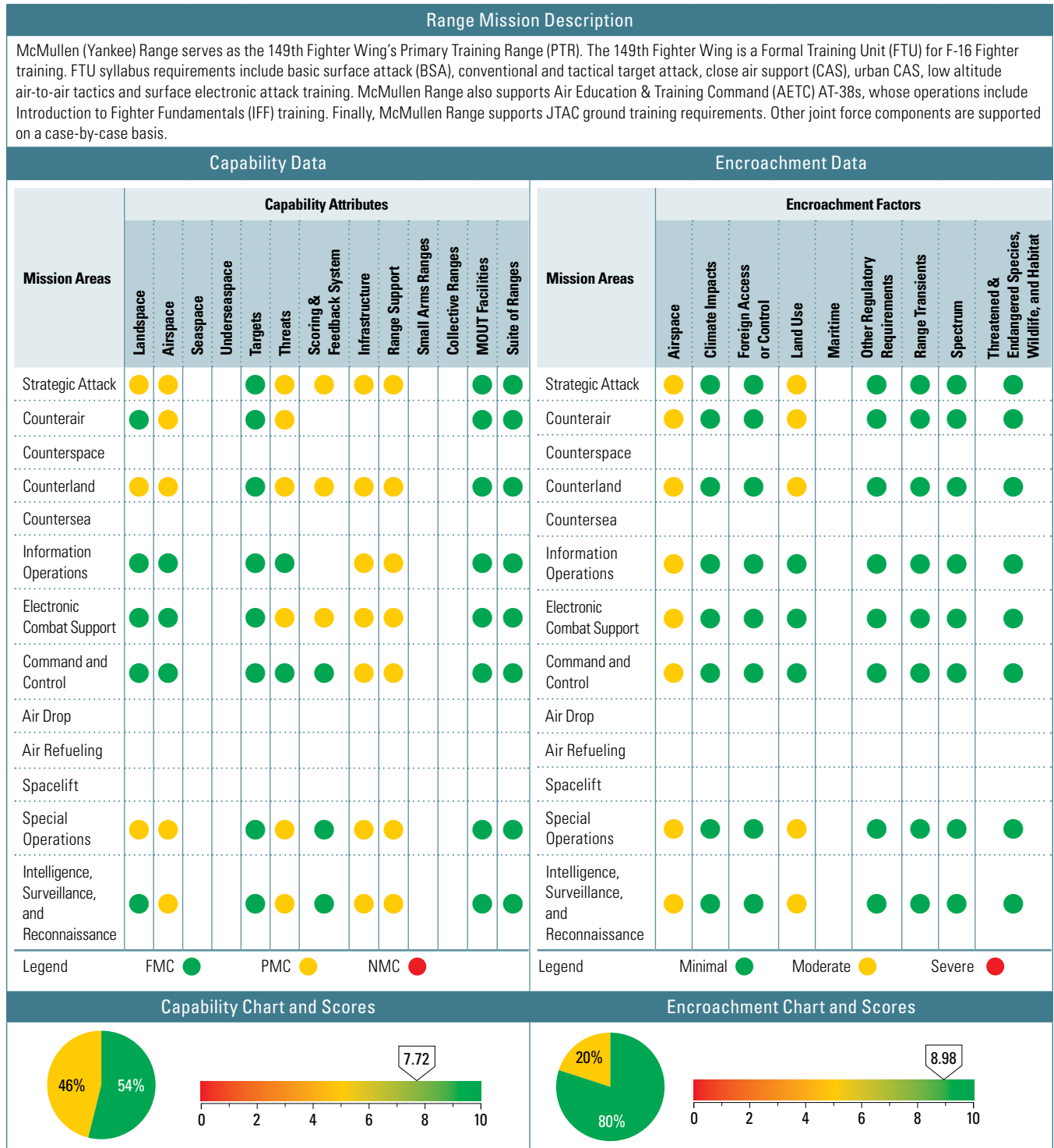
Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)**Jefferson Detailed Comments****Encroachment Capabilities**

Factors	Assigned Training Mission	Score	Comments
Land Use	Counterland	●	The land adjacent to the range is Army owned and operated by USFWS. All training activity must be conducted within the 1,100 acres of range property under the current MOA. A new MOA with the Army and USFWS is currently being written to allow expanded training on the approximate 49,000 acres of Big Oaks National Wildlife Refuge.
	Command and Control	●	Same as above.
	Air Drop	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance, and Reconnaissance	●	Same as above.
Other Regulatory Requirements	Strategic Attack	●	There is a high volume of UXO in impact areas. Additional target arrays cannot be constructed which restricts training capability. The plan is to continue the removal of UXO during annual clearances and other times as the budget allows.
	Counterland	●	The range has approximately 1,100 acres for the development of target arrays under the current permit and MOU but it is contaminated with UXO. Target arrays cannot be developed in these areas due to the UXO contamination which restricts training capability. The plan is to continue the removal of UXO during annual clearances and other times as the budget allows.
	Special Operations	●	Same as above.
Threatened & Endangered Species, Wildlife, and Habitat	Strategic Attack	●	The range hosts several protected species which inhabit areas surrounding current impact areas. These protected species restrict training to approximately 1,100 acres. A new MOA with the Army and USFWS will allow expanded training to the additional 49,000 acres of Big Oaks National Wildlife Refuge and decrease the impact on these species.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Air Drop	●	Same as above.

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Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

McMullen Assessment Details



McMullen Assessment Details

Summary Observations							Summary Observations						
A lack of manpower is the primary concern for McMullen Range. IAW the 2015 NGB/A1 Ranges Manpower Study, the range is undermanned. At current levels, the range is unable to meet minimum crew size required IAW NGB/A3 policy, to support all requirements of assigned range users. Secondary to manpower, basic range infrastructure, buildings, airspace and landspace marginally support current and projected operations. Efforts are underway to address all of these areas and viable solutions are achievable, but may require MAJCOM level attention/resources/emphasis to produce desired outcomes/resources.							Limited airspace, coupled with increasing/competing user requirements is a top concern for operations at McMullen Range. Restricted area R-6312 over McMullen Range is inadequate to support realistic maneuver. It consists of a five NM radius circle from the surface to flight level (FL) 230. R-6312 is often capped at 10,000 ft. due to Houston Center and/or Navy operations. The impact to training includes limited capability for maneuver and potential for spillout into unprotected airspace. Secondary to this is landspace encroachment with adjacent oil field operations degrading night operations and potentially encroaching weapon danger zone footprints.						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	8.42	8.42	6.27	7.94	7.94	7.99	Encroachment Scores	8.92	8.92	9.81	9.77	9.77	9.72
Fighter pilot training production demands and increases to locally assigned aircraft/aircrew are growing beyond current manpower capabilities of McMullen Range. Additional manpower is forecasted for 2018, but if the positions are not filled, training production will be impacted. Increased training demands also require additional infrastructure, land/airspace to effectively accomplish user requirements. Efforts are underway to address all of these areas and viable solutions are achievable, but may require MAJCOM level attention/resources/emphasis to produce desired outcomes/resources.							Encroachment pressure in both airspace and landspace have been steadily increasing. Airspace encroachment pressure will be further exacerbated with addition of more aircraft competing for limited airspace. There is a current proposal in progress to expand and segment R-6312 to allow for increased maneuver space to alleviate this issue. The proposal is in the initial stages of development. Anticipated date for resolution is beyond two years. Landspace encroachment pressure has plateaued to a large extent, but may increase in the future if oil and gas exploration/drilling resumes in response to market demand.						

McMullen Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Strategic Attack	●	McMullen Range landspace is insufficient for realistic full-scale inert weapon employment and low angle strafe. The current leased landspace of approximately 3000 acres (with only a 360 acre impact area) severely limits full-scale inert and precision guided munition weapon releases due to the size of weapon danger zone footprints. Discussions to extend the leased land in order to support WDZ footprints is in the initial development phase with the Navy and NGB/A3. The timeline for resolution is to be determined.
	Counterland	●	Same as above.
	Special Operations	●	Same as above.
Airspace	Strategic Attack	●	Restricted Area R-6312 over McMullen Range is inadequate for realistic maneuvering. It consists of a five NM radius circle from the surface to FL 230. R-6312 is often capped at 10,000 ft. due to Houston Center and/or Navy operations. The impact to training includes limited capability for maneuver and potential for spillout into unprotected airspace. There is a current proposal in progress to expand and segment R-6312 to allow for increased maneuver space. The proposal is in the initial stages of development. Anticipated date for resolution is beyond two years.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance and Reconnaissance	●	Same as above.
Threats	Strategic Attack	●	The range has limited radar threat capability. The assigned RWR-Lite emitters are currently inoperative and provide very limited threat simulation (line of sight only, low-fidelity single digit threats) when working. Discussions to integrate into the ANG threat sharing program during peak use periods have been discussed and are ongoing. Solution timeline is to be determined.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance, and Reconnaissance	●	Same as above.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

McMullen Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Scoring & Feedback System	Strategic Attack	●	The range currently uses the standard Joint Air Weapon Scoring Set; however, it is one of the oldest in the inventory. Current database capabilities cannot provide scoring/feedback for all targets in the impact area. The equipment is dated and nearing end of its life cycle. Upgrades are being scheduled. The range requires the Weapon Impact Scoring System Version 5, additional databases/cameras and infrared (IR) capable cameras to score all weapons. Timeline is still to be determined. The range is working with NGB/A3, Air Combat Command and Navy Corona to address.
	Counterland	●	Same as above.
	Electronic Combat Support	●	McMullen Range currently has no means of providing electronic countermeasures (ECM) or threat feedback to participating aircraft. There are no planned actions to address this issue at this time.
Infrastructure	Strategic Attack	●	Range infrastructure is comprised of portable-style buildings, which are non-permanent in nature. There is minimal communication infrastructure to support connectivity outside the range. There are no permanent facilities for personnel or equipment used to maintain targets, roads, fire breaks, communications equipment, structural maintenance equipment, and information technology (IT) connectivity beyond minimal requirements (phone and LAN). Real property must be acquired or leased in excess of 20 years in order to erect permanent structures/facilities on the range. Initial discussions have been started with the Navy, as the land-lease holder, to determine the possibility of re-structuring the land lease for 25 years or more, to access MILCON funding for permanent facilities.
	Counterland	●	Same as above.
	Information Operations	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Command and Control	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance, and Reconnaissance	●	Same as above.
Range Support	Strategic Attack	●	In accordance with the 2015 NGB/A1 Ranges Manpower Study, McMullen Range is undermanned. At current manning levels, the range is unable to meet minimum crew size, as required by NGB/A3 policy, to support split operations. McMullen Range is required to split shifts when operational duty days are in excess of 12 hours to preserve crew rest in accordance with Air Force Instruction (AFI) 13-212_ANGSUP_1. Primary unit supported is the 149th Fighter Wing, with 18 primary aircraft assigned (PAA). With existing training requirements, intensive flying periods already extend beyond a 12 hour duty day for range crew. The 149th FW is scheduled to increase from 18 to 24 PAA, which will further exacerbate this issue, extending range duty day far beyond 12 hours on a consistent basis. In support of manpower study findings, NGB/A1 has updated the range's Unit Manning Document. Additional ANG resources are currently being pursued in POM 19. Solution is to be determined.
	Counterland	●	Same as above.
	Information Operations	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Command and Control	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance, and Reconnaissance	●	Same as above.

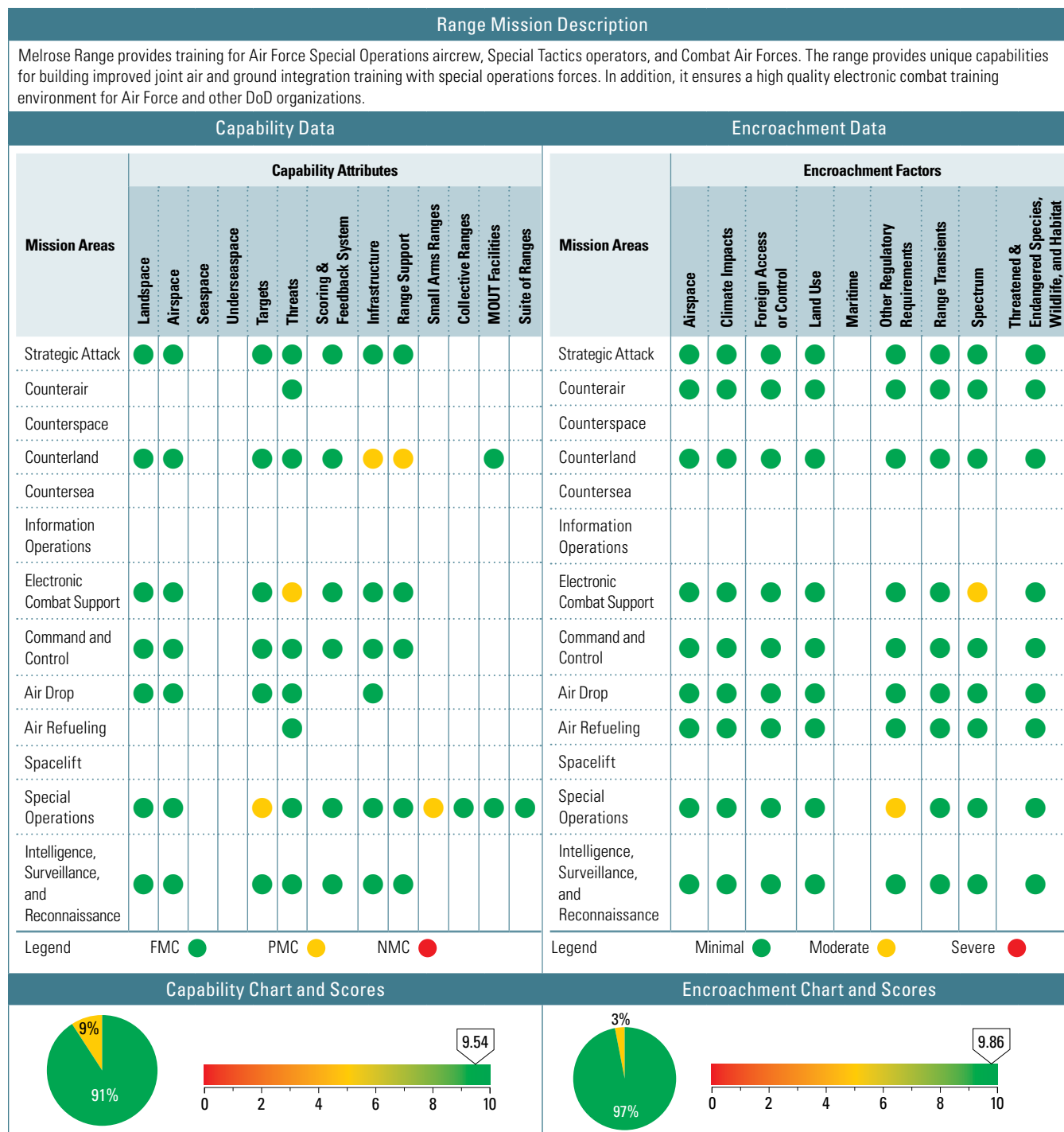
McMullen Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Strategic Attack	●	Restricted Area R-6312 over McMullen Range is inadequate for realistic maneuvering. It consists of a five NM radius circle from the surface to FL 230. R-6312 is often capped at 10,000 ft. due to Houston Center and/or Navy operations. The impact to training includes limited capability for maneuver and potential for spillover into unprotected airspace. There is a current proposal in progress to expand and segment R-6312 to allow for increased maneuver space. The proposal is in the initial stages of development. Anticipated date for resolution is beyond two years.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Information Operations	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Command and Control	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance, and Reconnaissance	●	Same as above.
Land Use	Strategic Attack	●	Oil field activity in the local area has pressed exceedingly close to leased range property. Oil well flares and drilling activity pose night lighting encroachment issues. The installation is continuously working with land owners/oil companies to mitigate where possible. No solution beyond mitigation and training to operate in degraded night environment.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance and Reconnaissance	●	Same as above.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Melrose Air Force Range Assessment Details



Melrose Air Force Range Assessment Details

Summary Observations							Summary Observations						
The Melrose Range legacy configuration is not conducive to SOF air/ground integration training. The range footprint is only 70,000 acres with 1,000 acres for live impact area. This limits training with current advanced weapons and restricts ground maneuver for air integration training. Since the last SRR, AFSOC and Melrose ROA developed a range reconfiguration plan to better support the joint SOF training. The legacy range facilities are being relocated and replaced out of the central range area to the Northwest Development Area (NWDA) which increases the size of the central impact area. HAF approved using the central impact area (5,300 acres) for live munitions and creating a new inert impact area. The range control tower relocation will be complete in FY2017. The other range facilities will be moved to the NWDA in FY2018 enabling advanced full mission profile scenario training.							Wind development in eastern New Mexico has been an ongoing concern for the range's Range Operating Authority (ROA). The ROA developed a three-phase plan to create buffer land around the range using the DoD REPI Program. DoD funds were awarded in November and the ROA has successfully engaged the State of NM for partner funding. The Melrose Range is small at approximately 70,000 acres. This limits some readiness air-to-ground training with advanced weapons and ground maneuver for air integration training. Since the last SRR, AFSOC and the Melrose ROA developed a range reconfiguration plan to better support joint air integration training. This includes moving legacy range facilities out of the central range to the Northwest industrial area and re-using the entire former live impact area in the central part of the range. HAF has approved re-opening the central impact area for explosive munitions (5,300 acres) and approved a new inert only impact area adjacent to the live impact range. The range control tower relocation will be complete in FY2017 and the other facilities will be moved in FY2018.						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	9.05	9.05	10.00	9.50	9.50	8.64	Encroachment Scores	9.32	9.32	9.75	9.60	9.72	9.55
The Melrose Range legacy configuration is not conducive to SOF air/ground integration training. Further, the Melrose Range is only 70,000 acres with 1,000 acres for live impact area. This limits training with current advanced weapons and restricts ground maneuver for air integration training. Since the last SRR, AFSOC and Melrose ROA developed a range reconfiguration plan to better support the joint SOF training. The legacy range facilities will be relocated and replaced out of the central range area to the NWDA which increases the size of the central impact area. HAF approved re-opening the central impact area (5,300 acres) for explosive munitions. The range control tower relocation will be complete in FY2017. The other range facilities will be moved to the NWDA in FY2018 enabling advanced, full mission profile scenario training. The in-commission rate of the Electronic Warfare Range threat systems has diminished over the last several years due to reduced range funding. The funding situation is projected to turn around by FY2018.							Encroachment from wind development will continue to be a concern to the Melrose Range mission. Further air/ground integration training opportunities at this range may be curtailed due to pressures from developers. AFSOC/27 SOW has pursued the DoD REPI Program to mitigate the wind development encroachment. 27 SOW was awarded \$1.5M through REPI for Phase 1 of the effort to create a buffer for no development above 100 feet above ground level.						

Melrose Air Force Range Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Targets	Special Operations	●	The relocation of the range support compound and subsequent expansion of the impact area will make the current temporary flat range (for small arms) unusable. A new multipurpose small arms range will be located in the NWDA to enable use of the full compliment of small arms. This range will require a Range Officer structure (elevated 10ft.x10ft.), communications, various targets, target lifters, control mechanisms, storage, and flag pole.
Threats	Electronic Combat Support	●	Range funding cuts have impacted the Electronic Combat Range Manager's ability to repair threat systems. Threat systems have degraded as non-fly depot-level repairs go unrepaired. The funding situation is projected to turn around by FY2018. Air Combat Command is planning to redistribute mini-MUTES equipment which will reduce the range's inventory from nine to seven systems.
Infrastructure	Counterland	●	The range support complex move will be complete in 2018, after which the newly expanded impact area will be operational. Due to programming problems, this will be prior to a new functioning firehouse in the NWDA, thereby requiring interim accommodations for fire and medical personnel.
Range Support	Counterland	●	Current deconfliction is accomplished via Center Scheduling Enterprise (range scheduling tool), through procedural controls, and on-site Range Control Officers. Currently, there is no automated or enterprise solution for tracking the multitude of range users that include tactical users, construction crews, tours, repair crews, and deliveries. The 27 SOW is seeking an established range operations control center system in line with 96th Test Wing Joint Test and Training Operations Control Center (JTTOCC) to provide an off-the-shelf collaborative environment that will address this deficit. Estimated completion date is 2020.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)**Melrose Air Force Range Detailed Comments****Capability Observations**

Attributes	Assigned Training Mission	Score	Comments
Small Arms Ranges	Special Operations	●	The range does not have a designated small arms range. The small arms range is located near the current administration building and has limited capacity and few field expedient targets. It will no longer be a usable range on 1 Oct 2018 due to the expansion of the impact area. With the assignment of AFSOC Battlefield Airmen to Cannon Air Force Base, a new multi-purpose small arms qualification and proficiency range is required. The range should enable unit-level training and proficiency training during extended stays at Melrose Range.

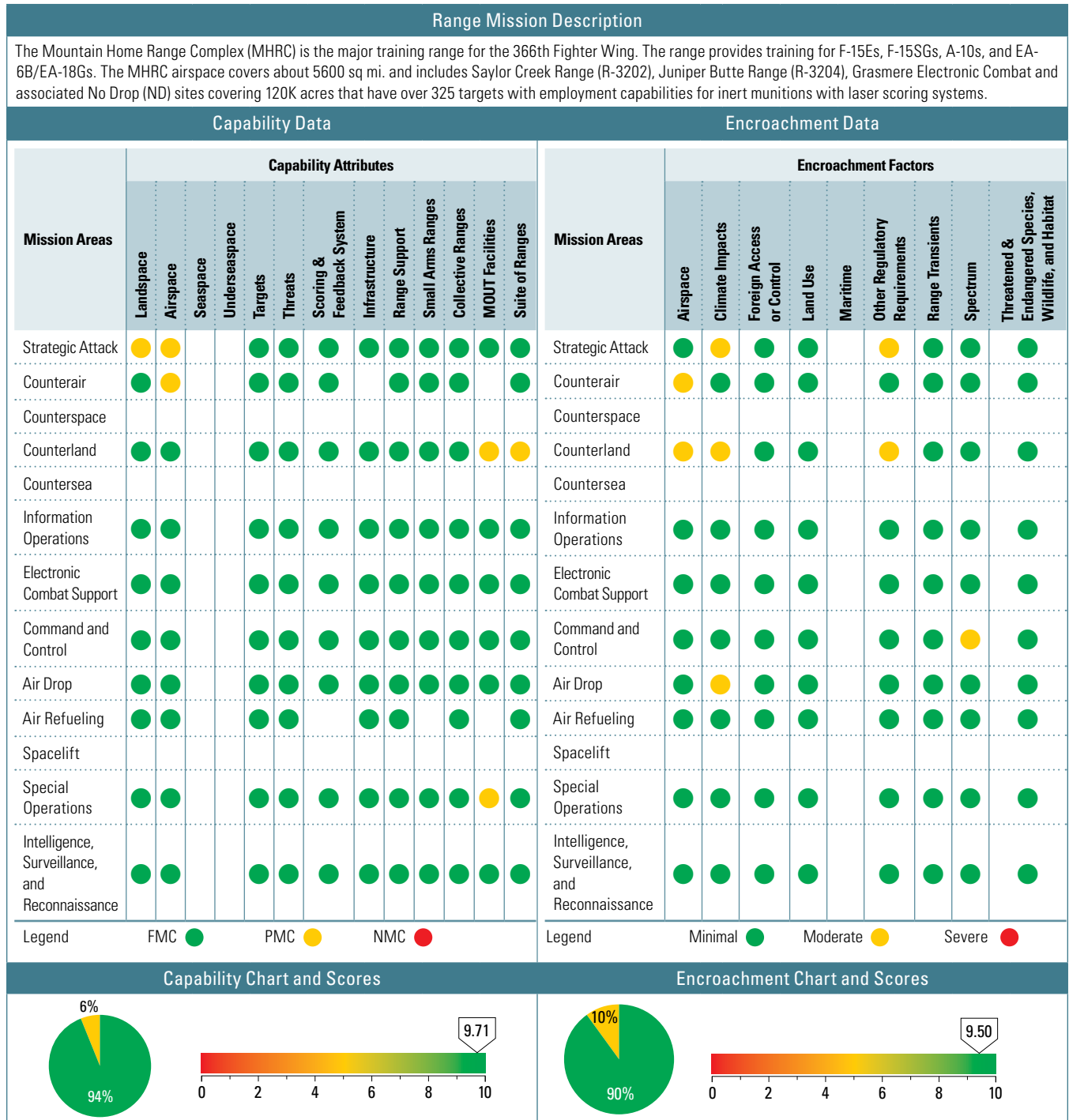
Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Other Regulatory Requirements	Special Operations	●	There are 268 cultural sites with the addition of 36 new sites within the leased-gift area. These sites limit the utilization of the already small range. These sites inhibit ground maneuver of training forces.
Spectrum	Electronic Combat Support	●	There are four frequencies not available: 15.4 GHz earth exploration satellite (passive), 3930 MHz satellite broadcast, 668 and 878 MHz White Sands Missile Range FCC restriction. There are minimal impacts on training and there are workarounds in place. There is no immediate remedy available and restrictions are not anticipated to change.

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Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Mountain Home Ranges Assessment Details



Mountain Home Ranges Assessment Details

Summary Observations							Summary Observations						
The capability attributes with the most impact to range operations are the close proximity of the air-to-ground ranges (coupled with user demand), the number and type of threat emitters, and low-fly capabilities. Additionally, the limited mountainous terrain low-fly outside of MTRs and limited lower altitude supersonic limitations effect low altitude proficiency and large force exercise realism for strategic attack and counterair. Finally, there are no urban areas that underlie the range's airspace to allow realistic MOUT training effecting counterland and special operations missions.							The encroachment factors that most impact the range's ability to perform its assigned missions are size, location, and weapons limitations for both R-3204 and R3202's impact areas. These factors create a significant limitation for weapons with larger munition footprints, preventing realistic delivery profiles. The mission areas most severely impacted are counterland and strategic attack for air-to-surface munitions. Live weapons training must be accomplished at other ranges that are able to support this training. At times, wildfires or the risk of fire impact the range's ability to provide training. Annually, from June through September, the range operates under restrictions for dropping any ordnance due to risk of fire.						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	10.00	10.00	10.00	10.00	10.00	10.00	Encroachment Scores	9.89	9.89	10.00	10.00	10.00	9.90
The capabilities assessment rating for the MHRC has decreased to reflect the evolving needs of the users of not only the ranges, but the MHRC airspace. The assets and resources available include 120x80NM of airspace, electronic training squadron with realistic threat emitter replication sites, and numerous drop and no-drop target sets. The impact area on Saylor Creek and Juniper Butte ranges are constantly upgraded with new targets and weapons employment capabilities. In order to support both Mountain Home AFB users and visiting units, the airspace and range construct must be adapted to meet the user needs. Airspace actions defined in the comments below are the solutions to these evolving needs and will take shape between 2018-2022.							The current encroachment pressures have minimal impact on the range's ability to support its assigned mission training. Future encroachment will likely be tied to airspace modifications related to noise abatement or environmental considerations through analysis and implementation of proposed airspace actions.						

Mountain Home Ranges Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Strategic Attack	●	Mountainous low fly usability is limited to MTRs in the MHRC. Current airspace restrictions force artificial vertical shelves and one-way MTRs which cause aircraft to be predictable when exiting mountainous terrain disrupting training objectives. There is a planned modification of the Mountain Home Range airspace which will lower the floors throughout the MHRC, but the earliest estimated completion is in 2021.
Airspace	Strategic Attack	●	During strategic attack large force exercises (LFE), the utilization of the triangle of airspace (POD-Ex) over Mountain Home AFB to the north of the MHRC is necessary both laterally and vertically to accommodate air refueling and C2 operations along with the red and blue air forces necessary to provide realistic training scenarios. Without the extra airspace, the number of users and capacity of training for LFEs becomes limited. Gunfighter MOA is a proposed solution which will allow for seamless transition and activation on an as-needed basis, but the earliest estimated completion is 2019.
	Counterair	●	Supersonic operations throughout the MHRC have a shelf between MOAs. The artificial shelf limits red air's ability to provide accurate threat replication and blue air's ability to go supersonic tactically which reduces the quality of training. The Modification of the Mountain Home Range airspace focusing on lowering the floors also includes a proposal to create a uniform supersonic altitude throughout the MHRC. The estimated completion for these actions is 2021.
MOUT Facilities	Counterland	●	The MHRC has a limited urban village comprised of shipping containers on Saylor Creek Range (SCR). True MOUT training is accomplished there and on Mountain Home AFB. Other potential sites for MOUT training, to include nearby cities, will be analyzed for environmental impact so ground and air assets will have a greater variety of terrain/masking/personnel challenges to simulate real-world urban CAS environments. SOF, JTAC, Combat Controllers, and other ground parties that use the range have limited training with air assets on SCR or at MHAFB. Also, fighter aircraft are unable to train in a realistic environment like they are seeing in deployed MOUT environments. The Idaho Urban CAS initiative is currently in the proposal stage for environmental analysis to increase MOUT options for air and ground CAS training and is estimated to be completed in 2018. Gunfighter MOA will also allow airspace to be activated over the urban areas in question on an as-needed basis and is estimated to be completed in 2019.
	Special Operations	●	Same as above.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Mountain Home Ranges Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Suite of Ranges	Counterland	●	All air-to-ground ranges are located in the same 40x40 NM piece of land in the Northeast portion of the MHRC (Jarbridge North MOA). Training is impacted due scheduling capacity versus demand for these ranges based on the MHAFFB and visiting units that use them daily. A Comprehensive Range Plan (CRP) has been created which proposes to address this issue by expanding the MHRC range capability to the opposite end of the range which would allow for greater training capacity for air-to-surface engagements. This solutions has not yet formally been proposed to leadership so there is no estimated completion date.

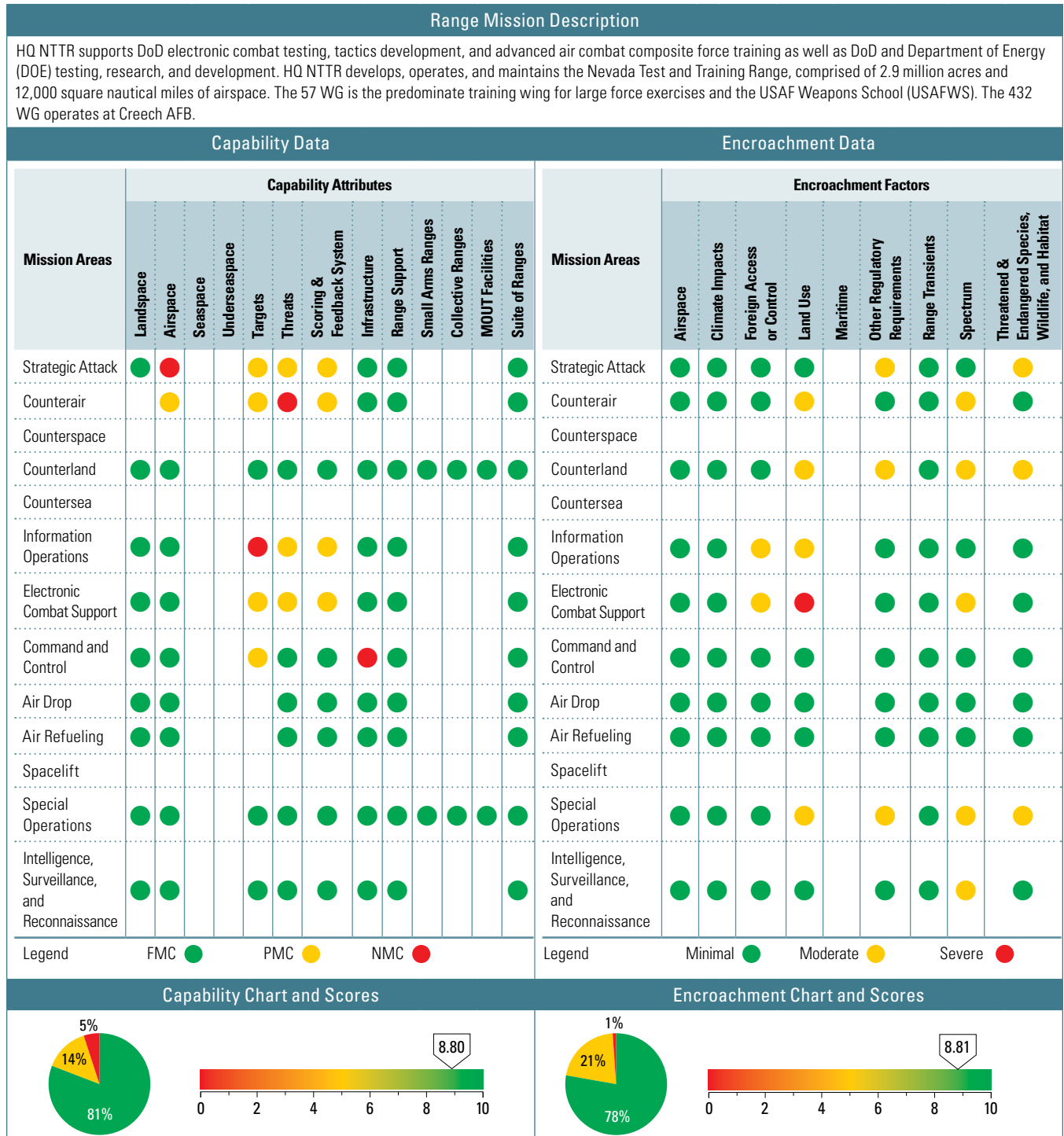
Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Airspace	Strategic Attack	●	As nations/threats continue to advance their capabilities and tactics, the MHRC must adjust to ensure it provides a realistic training environment. Airspace limitations negatively impact day-to-day training as well as large force exercises by placing artificial limits on supersonic activities and airspace floors. These airspace restrictions also limit the range's ability to accommodate air refueling and command and control operations with the red and blue air forces necessary to execute realistic training scenarios. Multiple plans are in coordination to include expanding a MOA to allow more vertical and lateral separation of aircraft, uniform application of supersonic restrictions across the airspace and lowering of floors in the southern areas. These actions should be complete by 2021.
	Counterland	●	As nations/threats continue to advance their capabilities and tactics, the MHRC must adjust to ensure it provides an environment that meets training requirements. Airspace and range limitations impact the MHRC's ability to simulate realistic urban CAS operations. Multiple efforts are underway to include an increase in "urban village" target sets, a MOA expansion to allow overflight of Mountain Home AFB as well as other small communities, and an urban CAS initiative to provide realistic military training off federal grounds. These actions should be completed by 2019.
Climate Impacts	Strategic Attack	●	The climate is extremely dry and makes the range susceptible to wildfires. In addition to seasonal range restrictions that limit when and what kind of munitions can be dropped, there are times when no munitions may be dropped due to the fire condition. Contract fire teams support a limited window of range operations and various vegetation controls are utilized to minimize fuel sources. There are ongoing cheatgrass initiatives; however, there is no resolution date.
	Counterland	●	Same as above.
	Air Drop	●	Same as above.
Other Regulatory Requirements	Strategic Attack	●	The ranges cannot support live weapons training or weapons with large footprints which requires users to use alternate ranges. Training is negatively impacted because live weapons are prohibited and restrictive run-in headings are required. There is no resolution date.
	Counterland	●	Same as above.
Spectrum	Command and Control	●	With the growing number of users on the range and surrounding ranges, as well as future capabilities coming online in the next few years, the ability to operate tactical datalinks will be negatively impacted by regulatory requirements. Currently, the Utah Test and Training Range and the MHRC are constantly competing for datalink usage, meaning one or the other is negatively impacted to support the other's training. A lack of datalink results in not being able to fully train using the digital capabilities that would be used in combat and it limits our ability to integrate with 5th generation platforms. Bases can apply for a waiver when spectrum limits are expected to be exceeded, but these are difficult to obtain and there are no other viable mitigation techniques that do not negatively impact training. This is not currently a limitation, so there is no resolution date.

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Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Nevada Test and Training Range (NTTR) Assessment Details



Nevada Test and Training Range (NTTR) Assessment Details

Summary Observations							Summary Observations						
The most impactful capability attributes are, in order: airspace, threats, targets, scoring and feedback systems. The mission areas most impacted are: counterair, strategic attack, electronic combat, counterland, and information operations.							Renewable Energy (RE) project siting around the NTTR creates spectrum interference due to radiofrequency/electromagnetic (RF/EM) compatibility issues. In addition, land development and subsequent overflight noise issues are increasing under the Desert MOA. The ability to develop the southern ranges is limited due to compatibility concerns from the USFWS since approvals are required for co-use of the Desert National Wildlife Range (DNWR) per the stipulations in the Military Lands Withdrawal Act (MLWA) of 1999. Finally, increased foreign business interests adjacent to the NTTR create operational security (OPSEC) concerns. Mission areas impacted include Electronic Combat Support due to RE projects and spectrum encroachment; counterland training due to munitions restrictions and incompatible use with the USFWS designation of land use planning constraints in the DNWR; counterair training due to developmental pressures, noise complaints, and spectrum constraints due to frequency selloff; strategic attack training due to munitions restrictions and incompatible use with the USFWS designation of land use planning constraints; and special operations training due to munitions restrictions and incompatible use with the USFWS designation of land use planning constraints due to the Wilderness Study Areas (WSA).						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	8.22	8.22	8.39	8.31	8.31	8.48	Encroachment Scores	8.62	8.24	8.26	8.56	8.71	8.73
Threats and targets went to RED due to the lack of capability to support 5th generation aircraft training requirements. This worsening condition was recognized in the 2025 Air Test and Training Range Enhancement Plan released by the SECAF in January 2014. This plan documented the lack of capabilities and predicted future impacts. The Site Activation Task Force (SATAF) IX for the F-35 at Nellis AFB documented a lack in range airspace capacity so this is still RED. Due to threat system sustainment challenges improving with increased funding levels, range support for counterair training improved from RED to GREEN. Likewise the other areas under range support went from YELLOW to GREEN due to improved funding. This is expected to continue into 2018 with the Electronic Warfare Infrastructure Improvement Program (EWIIP) threat systems being fielded. The full array will not have initial operating capability (IOC) until 2022. The impact to retainability of the current contract workforce with the budget cuts in the past was corrected in recent budgets. Electronic combat and information operation areas ratings have not changed since the 2015 report. Targets for information operations went to RED due to the lack of supervisory control and data acquisition (SCADA) targets and specifically the lack of the ability to attack a breakable IADS. Infrastructure for command and control is RED due to the lack of a Combined Operations Center (COC) Special Access Program Facility (SAPF) to accommodate the required classification data merge in the Range Operations Center (ROC). HQ ACC/A3A is working on an Enterprise Range Plan which may support NTTR's acquisition of needed capabilities. NTTR requested additional capabilities in the POM programming inputs. The FY2019 POM request included input for threat relevancy requirements as "signature representative" and "robustness in density". ACC has been successful in increasing sustainment funding levels as of FY2015, which has improved NTTR operations.							In the Land Use category, the only RED was due to renewable energy impacts to Electronic Combat Support due to electronic warfare impacts. This has not changed since the 2015 SRR. Renewable energy siting proposals are being addressed in the review process according to plan and there was one success in limiting impact. The Land Use category under Counterland and Special Operations remains YELLOW due to the USFWS land use limitations to these mission areas. Information Operations is YELLOW due to the risk of mining and oil exploration adjacent to the NTTR withdrawn lands. Other Regulatory Requirements (Cultural resources and Wetlands) have the same impact since the 2015 SRR. Spectrum category is YELLOW in five areas to reflect renewable energy impacts and/or GPS jamming limitations. Under Threatened and Endangered (T&E) category, the wilderness study area impacts listed were YELLOW in 2015 SRR and remain. New category was the foreign business interests near the NTTR (north of R-4807 and R-4809), under the Foreign Access category, this was coded YELLOW for Electronic Warfare as the lead area for this concern. The SECAF released the Air Test and Training Range Enhancement Plan in January 2014 and after HQ NTTR review, there are still valid concerns. Renewable energy impacts and encroachment concerns were noted in this report. There were Civil Engineering organizational changes that led to confusion in encroachment management processes and coordination. HQ NTTR's largest concern on encroachment oversight was the creation of the Air Force Installation and Mission Support Center (AFIMSC) with the Air Force Civil Engineer Center (AFCEC) below and with Installation Support Teams covering regions. There were subsequent changes at HQ ACC with the standup of Det 8, AFIMSC. HQ ACC manages the effort through an Encroachment Working Group with Det 8 and the other MAJCOM functionals. The 99 ABW has an office in 99 CES/CENPD for the Installation Encroachment Management Team (IEMT). NTTR/XP works with the IEMT. HQ NTTR has been updating encroachment pressures and process issues in the Defense Readiness Reporting System (DRRS) reports.						

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Nevada Test and Training Range (NTTR) Detailed Comments

Capability Observations			
Attributes	Assigned Training Mission	Score	Comments
Airspace	Strategic Attack	●	NTTR is experiencing increasing requirements for range airspace from the F-35 beddown at Nellis AFB (NAFB). Throughput is limited due to airspace capacity limitations in the NTTR airspace. Limiting aircraft and deployments at NAFB was recommended. The USAF/A3 will host a meeting to develop solutions to address NTTR utilization. The issue will be tracked in the F-35 SATAFs for NAFB.
	Counterair	●	Restrictions on range usage are increasing due to noise complaints, urban encroachment, and natural lands. Supersonic, chaff, flare, and overflight restrictions continue to shrink the usable airspace. Nellis has established noise sensitive avoidance areas around communities under the two MOAs.
Targets	Strategic Attack	●	There are no sensor fusion targets for 5th generation aircraft to train against with the aircraft's advanced sensors. These types of targets require costly infrastructure. This was noted in the 2025 Air Test and Training Range Enhancement Plan as "The technology of precision-guided munitions has generally shifted the focus of training from weapon employment to target identification, subsequently increasing the complexity of the targets required to accomplish realistic training." Some training may be able to be conducted in the simulators until the live environment has relevant hard targets that can interface with the 5th generation aircraft's advanced sensors. COMACC has directed the implementation of the Secure LVC Advanced Training Environment (SLATE) Advanced Technology Demonstration (ATD). The Air Force Research Lab (AFRL) is working the implementation of the ATD with HQ ACC.
	Counterair	●	Same as above.
	Information Operations	●	There are no self-contained Information Operations (IO) targets on the NTTR. Lack of SCADA targets for IO interface is the predominate concern. There is also a need for breakable and repairable IADS for cyber attacks. All IO play is based on the user equipment they bring to the range. NTTR has some means of facilitating IO play but no organic capability. HQ NTTR continues to work with the Joint Information Operations Range (JIOR) to provide a mobile service which can be deployed at the Urban Operations Complex (UOC) on Range 62. HQ NTTR is working with 24/25 AF and the 25 SRS to program a breakable IADS to support training requirements for space and IO.
	Electronic Combat Support	●	NTTR lacks a complete electronic target set. Electronic Attack (EA) platforms do not get real-time feedback on their capabilities and their effects during training. The range will continue to work on DIADS suite in order to show a real-time degradation on red systems based on real efforts of jamming platforms.
	Command and Control	●	For IO there are no red C2 targetable nodes. Jamming platforms do not get real-time feedback on operations. NTTR will be able to better simulate a degraded C2 system while maintaining safety by implementing DIADS and IO suite.
Threats	Strategic Attack	●	There are limited relevant double digit threat systems for fifth generation aircraft to test and train against. This requires costly threat infrastructure that has long lead development time. This issue was noted in the 2025 Air Test and Training Range Enhancement Plan as "The Air Force is supporting these efforts through collaboration with the DoD and the Department of the Navy to develop and field the Advanced Radar Threat System version 1 (ARTS1) and Advanced Radar Threat System version 2 (ARTS2). These systems provide a more realistic training environment because they will close the gap between our current and required threat simulation capabilities. This development effort (also known as the EWIP) uses a significant portion of the approximately \$550 million effort to develop and field 25 open air range threat emitters/simulators representative of advanced threat systems in the Western Pacific Region." Some training may be able to be conducted in the fifth generation simulators. There are limitations with integrating fourth and fifth generation aircraft since fourth generation aircraft were not designed to accept data infusion into the cockpit. COMACC charted the course for SLATE. AFRL is leading this ATD. HQ ACC and AFRL are working to field the test event at the NTTR in FY2018. SLATE will look at 4th to 5th generation aircraft interfacing.
	Counterair	●	Same as above.
	Information Operations	●	There are no IO threats on the NTTR. All IO play is based on the user equipment they bring to the range. The range has some means of facilitating IO play but no organic capability. HQ NTTR continues to work with JIOR to provide a mobile service which can be deployed at the UOC on Range 62. A breakable IADS that can be repaired is also a programmed requirement.
	Electronic Combat Support	●	NTTR lacks a complete electronic target set. EA platforms do not get real-time feedback on their capabilities and their effects during training. The range will continue to work on DIADS suite in order to show a real-time degradation on red systems based on real efforts of jamming platforms.

Nevada Test and Training Range (NTTR) Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Scoring & Feedback Systems	Strategic Attack	●	There are instrumentation challenges in podding forth and fifth generation aircraft with encrypted capability. This requires costly instrumentation infrastructure on the aircraft and in ground support. This was noted in the 2025 Air Test and Training Range Enhancement Plan as "The Common Range Integrated Instrumentation System (CRIIS) project will provide most MRTFB facilities with the capability to collect highly accurate time, space, position information and selected aircraft data bus information needed for advanced weapon systems testing. The enhancements provided by CRIIS enable interoperability across the major test ranges and support future F-35 testing." HQ ACC is looking at the technical solution. The P-5 pod will solve some of the data limitations but must be encrypted. Training can still be supported with the current NACTS (P-4) for feedback but is limited due to classification of data downlinks. The challenge is supporting the interface with the fifth generation aircraft's advanced weapons bus and allowing for real time kill removal. In FY2016 COMACC charted the course for SLATE. AFRL is leading this ATD. HQ ACC and AFRL are working to field the test event at the NTTR in FY2018. SLATE will look at fourth and fifth generation interfacing.
	Counterair	●	Same as above.
	Information Operations	●	There are no self-contained IO targets on the NTTR with scoring and feedback. All IO play is based on the user equipment they bring to the range. NTTR has some means of facilitating IO play but no organic capability. HQ NTTR continues to work with the JIOR to provide a mobile service which can be deployed at the UOC on Range 62.
	Electronic Combat Support	●	NTTR lacks a complete electronic target set. EA platforms do not get real-time feedback on their capabilities and their effects during training. The range will continue to work on DIADS suite in order to show a real-time degradation on red systems based on real efforts of jamming platforms.
Infrastructure	Command and Control	●	There are infrastructure issues for modernization in the Range Control Center at Bldg 200 at Nellis AFB. The ROC needs to be upgraded to a vault-level facility rated for special access program/requirement (SAP/SAR) levels to handle the classified information from feedback systems (i.e. a Special Access Program Facility (SAPF)). HQ NTTR has been preparing the design standards to upgrade the ROC to a SAPF. In FY2017 HQ NTTR plans to complete the first phase of the ROC modernization to the SECRET level. HQ NTTR will work around the lack of a SAPF but the quality of relevant training suffers since the classified data cannot be merged for full effects.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Foreign Access or Control	Information Operations	●	There is a concern of foreign espionage occurring from land adjacent to NTTR lands or under the airspace. The 2025 Air Test and Training Range Enhancement Plan stated, "An emerging challenge is the increasing presence of foreign business interests in the vicinity of our sensitive test and training ranges. When foreign companies build or acquire energy and mining projects near Air Force ranges, they gain the ability to maintain a permanent presence near areas vital to national security which affords them an opportunity to collect critical information regarding national defense programs." With this action "Foreign investment to acquire U.S. business that operate on land around DoD test and training ranges is another form of compatible land use that presents very unique challenges to range enhancement plans. The Air Force is active in the Council on Foreign Investment in the United States (CFIUS) process to evaluate the security risks of foreign investment in projects near test and training ranges." NTTR coordinates with ACC/A3A as required to elevate issues to HAF. The HQ ACC Encroachment Working Group has tracked issues with the HAF resulting from Nellis AFB IEMT concerns on foreign interests near Nellis AFB. This issue was not directly related to the NTTR.
	Electronic Combat Support	●	Same as above.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Nevada Test and Training Range (NTTR) Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Land Use	Counterair	●	Increased development of renewable energy projects in outlying rural areas adjacent to the NTTR has the potential to impact our ability to operate in a relatively clean electronic environment. The 2025 Air Test and Training Range Enhancement Plan was released by the SECAF in January 2014 and recognized the impact of renewable energy development. The combination of radar operations, employment of low observable technologies and need for unhampered feedback to the radars makes wind turbines incompatible with several critical USAF mission areas to include: weapons system certification, tactics validation, advanced weapon system training, realistic threat representation, and large force exercises. The Air Force Material Command (AFMC) and ACC developed a series of maps that can be used to simplify and expedite the review of renewable energy projects. These maps are referred to as Risk Adverse Impact on Military Operations and Readiness Areas (RAIMORAs), formerly known as HRAIZ. The 99 ABW's final encroachment management action plan has analyzed use of the RAIMORAs. Prior to responding to the DoD Siting Clearinghouse, the 99 ABW reviews RAIMORAs and coordinates with the HAF.
	Counterland	●	USFWS nominated approximately 590,000 acres of co-managed land within the southern range as proposed Wilderness. This severely restricts plans to place threats or targets at higher elevations or to provide future capabilities/modernization to microwave and communication data links. HQ NTTR is restricted from using old, existing roads and trails within the mountainous areas which limits the ability to fully utilize the land as Congress set forth in the MLWA of 1999. The Wilderness proposal currently sits in Congress and has not been acted on for close to 40 years. HAF must work with Congress and the Department of the Interior (DOI) to address this proposed Wilderness designation. HQ NTTR cannot solve the WSA issue in the operational memorandum of understanding (MOU) required by the MLWA of 1999 since USFWS has primary jurisdiction.
	Information Operations	●	There is a concern of foreign espionage occurring adjacent to NTTR lands or under the airspace if the Bureau of Land Management (BLM) allows use of public lands by mining or renewable energy developers. The 2025 Air Test and Training Range Enhancement Plan stated, "An emerging challenge is the increasing presence of foreign business interests in the vicinity of our sensitive test and training ranges. When foreign companies build or acquire energy and mining projects near Air Force ranges, they gain the ability to maintain a permanent presence near areas vital to national security which affords them an opportunity to collect critical information regarding national defense programs." With this action "Foreign investment to acquire U.S. business that operate on land around DoD test and training ranges is another form of compatible land use that presents very unique challenges to range enhancement plans. The Air Force is active in the CFUS process to evaluate the security risks of foreign investment in projects near test and training ranges." NTTR coordinates with ACC/A3A as required to elevate issues to the HAF.
	Electronic Combat Support	●	Increased development of renewable energy projects in outlying rural areas adjacent to the NTTR has the potential to impact our ability to operate in a relatively clean electronic environment. The 2025 Air Test and Training Range Enhancement Plan was released by the SECAF in January 2014 and recognized the impact of renewable energy development. The combination of radar operations, employment of low observable technologies and need for unhampered feedback to the radars makes wind turbines incompatible with several critical USAF mission areas to include: weapons system certification, tactics validation, advanced weapon system training, realistic threat representation, and large force exercises. The AFMC and ACC developed a series of maps that can be used to simplify and expedite the review of renewable energy projects. These maps are referred to as RAIMORAs, formerly known as HRAIZ. The 99 ABW's encroachment management action plan noted use of the HRAIZ. HQ NTTR through the IEMT reviews impacts. There is one case of elevation through the HQ ACC Encroachment Working Group. The Enterprise Wind turbine siting in Utah was forwarded to the HAF level before going to the DoD Siting Clearinghouse. The proponent withdrew the project in 2016.
	Special Operations	●	USFWS nominated approximately 590,000 acres of co-managed land within the southern range as proposed Wilderness. This severely restricts plans to place threats or targets at higher elevations or to provide future capabilities/modernization to microwave and communication data links. HQ NTTR is restricted from using old, existing roads and trails within the mountainous areas which limits the ability to fully utilize the land as Congress set forth in the MLWA of 1999. The Wilderness proposal currently sits in Congress and has not been acted on for close to 40 years. HAF must work with Congress and the DOI to address this proposed Wilderness designation. HQ NTTR cannot solve the WSA issue in the operational MOU required by the MLWA of 1999 since USFWS has primary jurisdiction.

Nevada Test and Training Range (NTTR) Detailed Comments

Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Other Regulatory Requirements	Strategic Attack	●	USFWS has primary jurisdiction of the southern ranges. In addition, USFWS nominated approximately 590,000 acres of co-managed land within the southern range as proposed Wilderness. This severely restricts plans to place threats or targets at higher elevations or to provide future capabilities/modernization to microwave and communication data links. HQ NTTR is restricted from the mountainous high terrain areas which limits the ability to fully utilize the land for military missions. Munitions drop areas are restricted to impact areas in the valley floors. The Wilderness proposal currently sits in Congress as a WSA and has not been acted on for close to 40 years. HQ NTTR cannot solve the WSA issue in the operational MOU required by the MLWA of 1999 since USFWS has primary jurisdiction. HAF must work with Congress and DOI to address this proposed wilderness designation.
	Counterland	●	<p>99 CES/CEI's Cultural Resource Manager oversees significant cultural sites in accordance with the 99 ABW's Cultural Resource Management Plan. The 99 CES/CEI has established working relationships with 17 Native American tribes for cultural affiliation on the NTTR. There are archaeological avoidance areas on the NTTR. Most of the cultural sites are outside of the operating areas for ground disturbing activities. Personnel are briefed to avoid the cultural sites. When necessary based on specific mission essential activities identified by HQ NTTR, protection of cultural resources needs to be investigated and coordinated with the 99 CES/CEI. 99 CES/CEI consults with Native American tribes as required.</p> <p>USFWS nominated approximately 590,000 acres of co-managed land within the southern range as proposed Wilderness and has set limitations due to USFWS primary jurisdiction set forth in the MLWA of 1999. This severely restricts plans to place threats or targets at higher elevations or to provide future capabilities/modernization to microwave and communication data links. HQ NTTR is restricted from using mountainous areas which limits the ability to fully utilize the land as Congress set forth in the MLWA of 1999. HQ NTTR cannot solve the WSA and compatibility issue until the land withdrawal renewal is completed in 2021.</p>
	Special Operations	●	Same as above.
Spectrum	Counterair	●	Frequency spectrum is in a sell off proposal through the FCC. Potential frequency spectrum sell off impacts the P5 frequency band used for NTTR instrumentation pods. The Air Combat Training Systems (ACTS) Transition Plan was submitted to the Air Force Spectrum Management Office. HQ NTTR approach is for a stand alone location with a minimum of two ACTS frequency pairs to support Red Flag/Weapons School/422 TES an a pair for Green Flag/ National Training Center. All transition plans are being compiled for the National Telecommunications and Information Administration (NTIA). The DoD continues to work with the NTIA and the FCC to determine ways to share spectrum when possible. HQ NTTR is tracking these efforts with HQ ACC/A3/A6.
	Counterland	●	GPS jamming is limited due to FAA restrictions and limited approved time periods. HQ NTTR approach is limit GPS operations to small areas. HQ NTTR is tracking the status with HQ ACC/A3/A6.
	Electronic Combat Support	●	HQ NTTR has conducted assessments on the impact of over 185 wind, 65 solar, and multiple power line and other renewable projects surrounding the NTTR in conjunction with 99 ABW as the IEMT lead office. Development of renewable energy projects in outlying rural areas adjacent to the NTTR has the potential to impact our ability to operate in a relatively clean electronic environment. The 2025 Air Test and Training Range Enhancement Plan released by the SECAF in January 2014 recognized this impact. Renewable energy continues to pose one of the most significant threats to testing and training needed for National Defense objectives. AFMC and ACC developed a series of maps used to simplify and expedite the review of renewable energy projects. These maps are referred to as RAIMORAs, formerly known as HRAIZ. The 99 ABW's encroachment management action plan noted use of the HRAIZ. HQ NTTR through the IEMT reviews impacts. There is one case of elevation through the HQ ACC Encroachment Working Group. The Enterprise Wind turbine siting in Utah was forwarded to the HAF level before going to the DoD Siting Clearinghouse. The proponent withdrew the project in 2016.
	Special Operations	●	GPS jamming is limited due to FAA restrictions and limited approved time periods. HQ NTTR approach is limit GPS operations to small areas HQ NTTR is tracking the status with HQ ACC/A3/A6.
	Intelligence, Surveillance, and Reconnaissance	●	Same as Electronic Combat Support.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)**Nevada Test and Training Range (NTTR) Detailed Comments****Encroachment Observations**

Factors	Assigned Training Mission	Score	Comment
Threatened & Endangered Species, Wildlife, and Habitat	Strategic Attack	●	99 ABW's INRMP identifies over 100 seeps and springs on the NTTR. The INRMP lists management goals that preserve habitat yet restrict military operations. While not classified as true "Section 404 wetlands", these areas should not be disturbed since they support wildlife habitat. Some are significant watering points for wild horses, antelope, bighorn sheep, deer and numerous small mammals, birds and reptiles. Several significant sites are fenced to prevent inadvertent ground activities. Most of the springs and seeps are outside major NTTR operating areas for most ground activities. HQ NTTR briefs personnel to avoid the seeps and springs with ground disturbing activities when practical.
	Counterland	●	NTTR has numerous wetlands as avoidance areas. 99 ABW's Integrated Natural Resource Management lists over 100 seeps and springs on the NTTR under paragraph 4.6, Water Resources. The INRMP lists management goals that preserve habitat yet restrict military operations. While not classified as true "Section 404 wetlands", these areas should not be disturbed since they support wildlife habitat. Some are significant watering points for wild horses, antelope, bighorn sheep, deer and numerous small mammals, birds and reptiles. Several significant sites are fenced to exclude inadvertent ground activities. Most of the springs and seeps are outside major NTTR operating areas for most ground activities. HQ NTTR briefs personnel to avoid the seeps and springs with ground disturbing activities, when practical in accordance with the 99 ABW's Integrated Natural Resource Management Program.
	Special Operations	●	Same as above.

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Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Poinsett Assessment Details

Range Mission Description																											
To provide realistic electronic combat (EC) and bombing and gunnery (B&G) training for the 20 FW, USAF and DoD aircrews.																											
Capability Data														Encroachment Data													
Mission Areas	Capability Attributes													Mission Areas	Encroachment Factors												
	Landspace	Airspace	Seaspace	Underspace	Targets	Threats	Scoring & Feedback System	Infrastructure	Range Support	Small Arms Ranges	Collective Ranges	MOUT Facilities	Suite of Ranges		Airspace	Climate Impacts	Foreign Access or Control	Land Use	Maritime	Other Regulatory Requirements	Range Transients	Spectrum	Threatened & Endangered Species, Wildlife, and Habitat				
Strategic Attack	●	●	●		●	●	●	●	●	●				Strategic Attack	●	●	●	●		●	●	●	●				
Counterair	●	●	●		●	●	●	●	●	●				Counterair	●	●	●	●		●	●	●	●				
Counterspace														Counterspace													
Counterland	●	●			●		●	●	●				●	Counterland	●	●		●		●	●	●	●				
Countersea														Countersea													
Information Operations														Information Operations													
Electronic Combat Support	●	●	●		●	●	●	●	●		●		●	Electronic Combat Support	●	●		●		●	●	●	●				
Command and Control														Command and Control													
Air Drop														Air Drop													
Air Refueling														Air Refueling													
Spacelift														Spacelift													
Special Operations														Special Operations													
Intelligence, Surveillance, and Reconnaissance														Intelligence, Surveillance, and Reconnaissance													
Legend	FMC ●			PMC ●			NMC ●							Legend	Minimal ●			Moderate ●			Severe ●						
Capability Chart and Scores														Encroachment Chart and Scores													
<div><div><div></div><div>17%</div><div>83%</div></div><div><div></div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div><div>9.14</div></div></div> <td colspan="10"><div><div><div></div><div>17%</div><div>83%</div></div><div><div></div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div><div>9.17</div></div></div></td>														<div><div><div></div><div>17%</div><div>83%</div></div><div><div></div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div><div>9.17</div></div></div>													
Summary Observations														Summary Observations													
There are an insufficient quantity and variety of double digit systems/simulators assigned to Poinsett Range. Only one of 14 assigned systems can accurately produce double digit surface-to-air missiles (SAM) simulations (two signals). Next generation threat simulators or real systems capable of double digit simulations are required and are in the planning stages. Systems to collect EC mission data from the Poinsett threat emitter systems is complete, EC fixed and mobile emitter data is routed through an EW multiplexer and feeds the data to an EW server located in the Shaw AFB War Room.														The major encroachment threat to Poinsett Range is the loss of frequency bands with the increase of cell towers operating in the area in the 800 MHz range. The loss of several frequency clearances allow the Multiple Threat Emitter System (MUTES) to operate only ninety-seven percent of the available signals. As frequency bands are claimed the future availability of spectrum for range EW training missions could be impacted.													

Poinsett Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	10.00	10.00	9.81	9.77	9.77	9.70	Encroachment Scores	10.00	10.00	9.92	9.92	9.92	9.85
Next generation threat simulators or real systems capable of double digit simulations are required and are in the planning stages at the Air Force level; there is no estimated completion date. The War Room/EC training intent is to accurately debrief pilots after suppression/destruction of enemy air defenses (SEAD/DEAD) training missions with actual emitter "truth" data. The combined data is not yet available in a package that enables a thorough SEAD debrief. This continues to be an ongoing project/process; there is no estimated completion date.							Poinsett Range has been able to limit physical encroachment through the active engagement of the 20FW and local authorities (city/county/state). Timely frequency requests and renewals will mitigate the impact that spectrum has on the use/availability of electronic threats.						

Poinsett Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Airspace	Strategic Attack	●	Gamecock D MOA is geographically too small to support opposed training. The warning areas are affected by weather and commercial air traffic. Bulldog MOA is geographically limited for valid training in an opposed mission, either defensive counterair (DCA), or offensive counterair (OCA)-escort/SEAD. DEAD/SEAD is better supported by the MOA; however, the multiple shelves make it complicated for pilots to descend to positively identify threats on the ground or for weather. The lateral confines need to increase to allow for a more valid, complete training area.
	Counterair	●	Same as above.
Threats	Strategic Attack	●	W177/161 has a set of emitters in the Bulit ATCAA; however, they are fixed sites and do not allow for variations of threat training. The airspace is usable for SEAD with the ability of the F-16 to create a training simulation; however, the ability to be targeted from real threats to allow for threat reactions is limited to coastline operations. The next best airspace for SEAD training is the Bulldog MOA. Overland it has a high altitude shelf in the East that does not allow for descent in the case of weather or to positively identify threat emitters, limiting utility for DEAD training. The mini-MUTES in the Bulldog MOA are static as well, meaning the ability to train with mobile threats is limited. Additionally, all of the range's emitters are only capable of replicating legacy SAM threats and need to be upgraded/replaced with the capability to replicate advanced SAMs.
	Counterair	●	Same as above.
	Electronic Combat Support	●	The range has an insufficient quantity and variety of double digit systems/simulators. Of the 14 systems currently assigned to the range, only one can accurately produce any double digit SAM simulations (two signals). Next generation threat simulators or real systems capable of double digit simulations are required and are in the planning stages.
Scoring & Feedback System	Electronic Combat Support	●	The range's system to collect EC mission data from threat emitter systems has been completed. EC fixed and mobile emitter data is routed through an EW multiplexer which feeds the data to an EW server located in the Shaw AFB War Room. The intent is to accurately debrief pilots after SEAD and DEAD training missions with actual emitter "truth" data. So far though radiation times, SAM shot engagement times, and SAM operator actions are not combined into a useful product to conduct a SEAD debrief. Discussions have been ongoing with all parties to improve this area but no definitive plan/guidance has been developed.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Airspace	Strategic Attack	●	The warning areas are commonly affected by Charleston International Airport due to taking away portions of the airspace during departures and approaches. When significant weather is present on the southeast coast, Jacksonville Center commonly "takes back" large portions of lateral and altitude chunks of airspace to route commercial airliners. The larger picture issue is the limited size of the range's available airspace (Bulldog, Poinsett) to physically operate in. W177B & 161B airspace is given less than fifty percent of the time up to the normal altitude of 30,000 ft. leaving significantly less airspace for high altitude tactics. Air traffic control (ATC) additionally calls back W161A/B South about fifty percent of the time, severely limiting intercept range to allow for valid tactics. There is no planned action/capability to prevent ATC from capping the airspace. Additionally, Atlanta Center and the FAA do not want to give any additional lateral amounts of airspace. Lastly, the over-water airspace is affected by winter weather patterns, causing wave heights, winds, and sea temperatures to be out of limits for training.
	Counterair	●	Same as above.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)**Poinsett Detailed Comments**

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comment
Other Regulatory Requirements	Strategic Attack	●	Live ordnance is not allowed on Poinsett Range due to such factors as target set availability, range airspace lateral confines, and noise concerns.
Spectrum	Counterair	●	The range has reported the loss of a few training radar frequencies within the last several years, limiting a small portion of training capabilities. Current percentage of granted frequency clearance requests is ninety-seven percent. The range currently has permission for most MUTES frequencies. The range also has all Mini-MUTES frequencies for any variant to be deployed at any of the fixed locations for Bulldog and Gamecock MOAs in order to change emitter types and fulfill their full training potential. Cell networks operating in the 800 MHz range have the most impact right now. However other frequency bands are quickly being claimed and could impact the future availability of spectrum for range EW training missions.
	Electronic Combat Support	●	Same as above.

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Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Polygone Assessment Details

Range Mission Description																									
Polygone Range provides EW training for NATO and is sponsored by a tri-lateral agreement with Germany, France, and the U.S.																									
Capability Data							Encroachment Data																		
Mission Areas	Capability Attributes												Mission Areas	Encroachment Factors											
	Landspace	Airspace	Seaspace	Underspace	Targets	Threats	Scoring & Feedback System	Infrastructure	Range Support	Small Arms Ranges	Collective Ranges	MOUT Facilities		Suite of Ranges	Airspace	Climate Impacts	Foreign Access or Control	Land Use	Maritime	Other Regulatory Requirements	Range Transients	Spectrum	Threatened & Endangered Species, Wildlife, and Habitat		
Strategic Attack	●	●			●	●	●	●	●					Strategic Attack	●	●					●	●	●		
Counterair	●	●			●	●	●	●	●					Counterair	●	●				●	●	●	●		
Counterspace														Counterspace											
Counterland	●	●			●	●	●	●	●					Counterland	●	●				●	●	●	●		
Countersea														Countersea											
Information Operations														Information Operations											
Electronic Combat Support	●	●			●	●	●	●	●					Electronic Combat Support	●	●					●	●	●		
Command and Control														Command and Control											
Air Drop														Air Drop											
Air Refueling														Air Refueling											
Spacelift														Spacelift											
Special Operations														Special Operations											
Intelligence, Surveillance, and Reconnaissance														Intelligence, Surveillance, and Reconnaissance											
Legend	FMC ●		PMC ●		NMC ●								Legend	Minimal ●		Moderate ●		Severe ●							
Capability Chart and Scores							Encroachment Chart and Scores																		
<div><div><div></div><div>43%</div><div>57%</div></div><div><div></div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div>7.86</div></div>							<div><div><div></div><div>23%</div><div>77%</div></div><div><div></div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div>8.86</div></div>																		
Summary Observations							Summary Observations																		
No comments.							No comments.																		
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections																		
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015												
Capability Scores	4.38	4.38	N/A	7.62	7.62	5.71	Encroachment Scores	5.27	5.27	N/A	8.50	8.50	8.00												
The range capabilities are relatively stable (not improving or degrading), but given that the European theater is in a particularly increasing threat area, the urgency of negative impacts to training is elevated.							These encroachment factors are relatively stable (not improving or degrading), but given that the European theater is in a particularly increasing threat area, the urgency of negative impacts to training is elevated.																		

Polygone Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Airspace	Strategic Attack	●	The deck at 10,000 ft makes training less practical and realistic. Realistic countermeasures are also limited. Training realism is degraded. There are no current plans to change this; requires approval from German civilian authorities.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.
Threats	Strategic Attack	●	Polygone Range is often a low priority for receiving modernized threat systems. This deprives the theater of training against the latest threat systems, particularly in the area closest to the “front” of a dynamic/emerging threat location. Polygone Range leadership continues to advocate for the latest equipment.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.
Range Support	Strategic Attack	●	Supply chain for existing threats is often dysfunctional (systems are often down for months due supply chain issues). Aircrew training against these EW threats cannot occur when these systems are down.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Airspace	Strategic Attack	●	The deck at 10,000 ft makes training less practical and realistic. Realistic countermeasures are also limited. Training realism is degraded. There are no current plans to change this as it requires approval from German civilian authorities.
	Counterair	●	Same as above.
	Electronic Combat Support	●	Same as above.
Other Regulatory Requirements	Counterair	●	Munitions transportation requirements from US Army Europe (USAREUR) often cause significant logistical burdens for transportation of Smokey SAMs. Limited resources (operations support team) are unnecessarily tied up with transportation issues, which detracts from mission focus.
	Counterspace	●	Same as above.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Razorback Assessment Details

Range Mission Description												
The mission of Razorback Range is to provide the Air National Guard, DoD, and approved foreign military customers the highest quality training environment by replicating the current geographical conflict landscape and providing a relevant digital environment while continuously adapting to the evolving needs of the warfighters and their equipment. This unique environment allows Airmen, Soldiers, Sailors, and Marines the ability to safely hone essential precision air and ground combat skills necessary to successfully engage the enemy today and in the future.												
Capability Data						Encroachment Data						
Mission Areas	Capability Attributes											Mission Areas
	Landscape	Airspace	Seaspace	Underseaspace	Targets	Threats	Scoring & Feedback System	Infrastructure	Range Support	Small Arms Ranges	Collective Ranges	
Strategic Attack	●	●			●	●	●	●	●			Strategic Attack
Counterair	●	●			●	●		●	●			Counterair
Counterspace												Counterspace
Counterland	●	●			●	●	●	●	●	●	●	Counterland
Countersea												Countersea
Information Operations	●	●				●		●	●			Information Operations
Electronic Combat Support	●	●			●	●		●	●			Electronic Combat Support
Command and Control	●	●			●	●		●	●			Command and Control
Air Drop	●	●			●	●	●	●	●	●	●	Air Drop
Air Refueling												Air Refueling
Spacelift												Spacelift
Special Operations	●	●			●	●		●	●	●	●	Special Operations
Intelligence, Surveillance, and Reconnaissance	●	●			●	●		●	●	●	●	Intelligence, Surveillance, and Reconnaissance
Legend	FMC ●	PMC ●	NMC ●									Legend
Capability Chart and Scores						Encroachment Chart and Scores						
Summary Observations						Summary Observations						
The largest detractor for training capabilities is insufficient landscape for modern precision weapons. During counterland training operations, aircrew are unable to employ GPS guided weapons due to the significant size of the weapon's footprint that extends well beyond the range's land. Currently all GPS weapons, with the exception of the A-10, are prohibited from employment.						The range is capable of performing it's daily mission effectively with significant effort required to deconflict operations with adjacent small arms ranges. The encroachment factor that most impacts range operations is adjacent land use, specifically counterland and special operations training.						

Razorback Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	9.88	9.88	9.52	9.52	9.52	9.76	Encroachment Scores	9.78	9.78	9.73	9.73	9.73	9.57
Capabilities have steadily increased over the years. Programmability at the National Guard Bureau (NGB) level has become range specific allowing for pinpointing needed capabilities versus assigning capabilities to all ranges regardless of need.							Encroachment issues impacting Razorback Range have remained constant over time. Impacts from nearby ranges are mitigated by ensuring a consistent dialogue with the Army's Range Control Function. The range also does real-time deconfliction to maximize and enhance mission profiles for users.						

Razorback Detailed Comments

Capability Observations

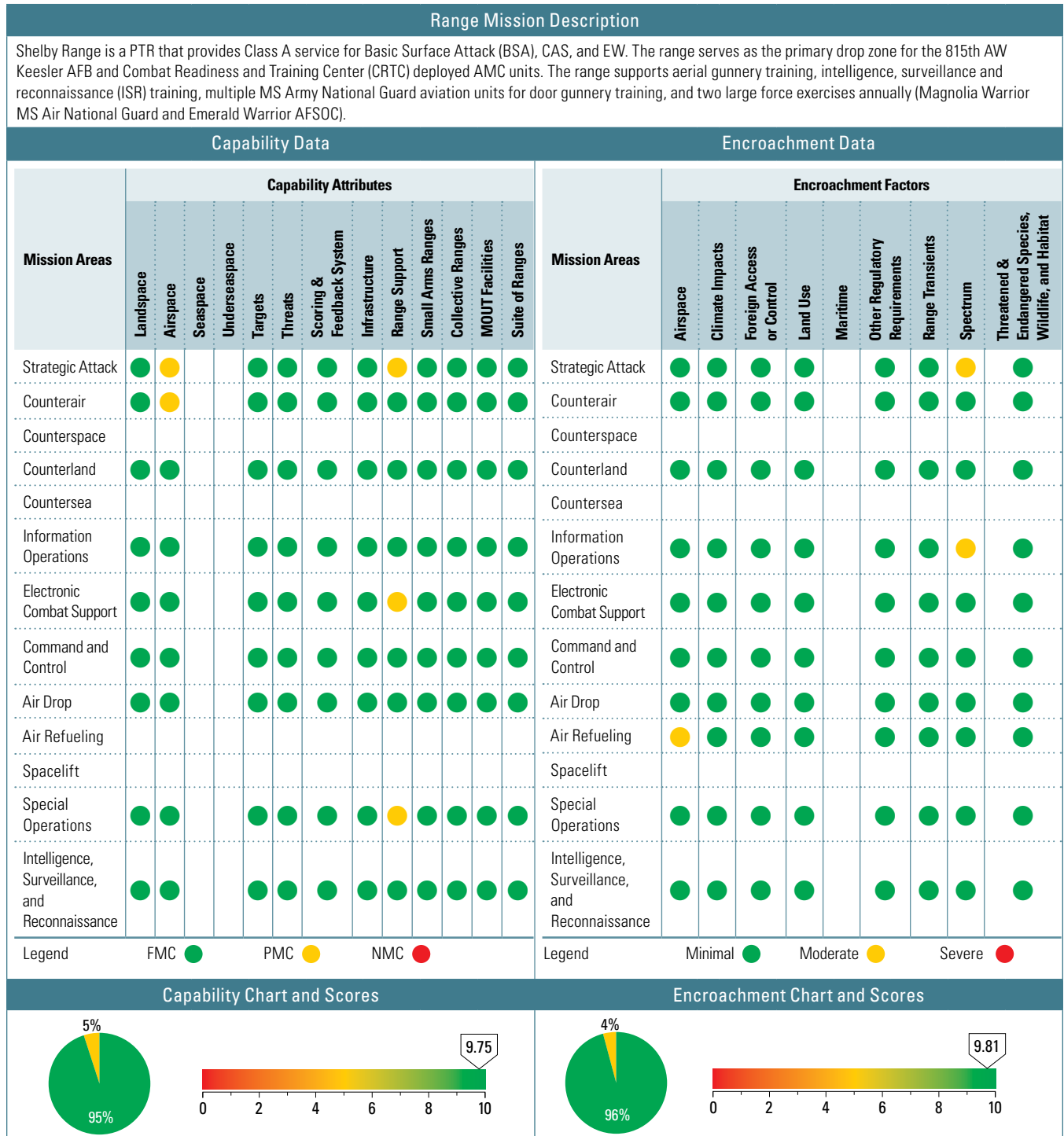
Attributes	Assigned Training Mission	Score	Comments
Landspace	Counterland	●	GPS PGM usage is extremely restrictive due to the size of the range's restricted area in comparison to the large footprint of the weapon (only the A-10 can use GPS PGMs on the range). Aircrew can only go through procedures to employ these weapons and do not gain the confidence in the munition that it will function as expected. There is no planned action to remedy this situation.
Threats	Electronic Combat Support	●	The antiquated equipment currently on the range is only capable of simulating older, single-digit threats; has limited range; and equipment reliability is steadily decreasing. Aircrews do not see the proper electronic signatures for advanced threats and cannot train properly to defeat these types of threats which are present in certain areas of responsibility (AOR) worldwide. There is no plan for smaller PTRs to acquire higher fidelity threat systems.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Other Regulatory Requirements	Counterland	●	Live munitions are not allowed on the range. This prevents aircrew/ground parties from training realistically. No change is anticipated due to land/populous restrictions (weapon footprints will not fit on the range).
	Special Operations	●	Same as above.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Shelby Assessment Details



Shelby Assessment Details

Summary Observations							Summary Observations						
Shelby Range lacks the large airspace typically required for strategic attack platforms; however, Shelby Range falls within the scope of the Gulfport CRTC and the associated southern warning areas. When taken together this makes a very desirable and realistic training range with realistic and appropriate threat systems. Special operations continue to train on the range and the two-way communications with Hurlburt Field have begun to improve in support of these specific training requirements.							Today's basic surface attack and close air support missions incorporate almost all of the range's resources. While the range's airspace is somewhat limited with the current SUA structure, the associated southern Warning Areas are adequate to support a full spectrum operation. Full spectrum operations must still be coordinated with the Eglin range complex but spectrum interference is minimal. The range's weakness is the austere environment and the lack of a stable IT link (e.g. a dedicated fiber line). Shelby Range is involved with regional exercises that demonstrate the full spectrum warfighting training capability.						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	9.88	9.88	9.90	9.75	9.75	9.75	Encroachment Scores	8.90	8.90	9.80	9.95	9.95	9.95
Scheduling airspace has been accomplished with direct action to the servicing Air Traffic Control Sector "Houston Center". During exercises, Shelby Range has been able to coordinate use of additional airspace to include a "corridor" from the Gulf of Mexico to the range; thus, expanding the range's ability to accommodate additional mission sets outside of basic surface attack and close air support. While no future airspace growth is projected, scheduling flexibility has been positive.							Shelby Range is located on a Joint Use Land Permit offered by the State of Mississippi. The actual land permit is offered to the MS Army National Guard. Due to this structure, operations on the range are coordinated directly and daily with the Army National Guard "Fires" Desk. While the DoD continues to purchase land on the ranges, it is still mostly recreational property within the MS Forestry Service. Historically there have been contracts and mineral rights offered to petroleum companies for harvesting such minerals. We continually update our CONOPS to incorporate the impact of drilling on training operations. The range's Joint Use Land Permit expires in 2020 and will be reviewed for renewal at that time.						

Shelby Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Airspace	Strategic Attack	●	There is inadequate airspace volume, both vertically and horizontally. This limits the number of aircraft and types of maneuvers allowed. An airspace proposal is in the works to increase vertical airspace in Desoto MOA I and II.
	Counterair	●	Same as above.
Range Support	Strategic Attack	●	There is limited authorized manning. This limits the operations that can take place and limits the amount and type of target area maintenance and improvement that can be conducted. An upcoming manpower study may alleviate this issue; however, the date of that study is TBD.
	Electronic Combat Support	●	Authorized manpower is limited and so are the hardware systems. Current EW threats are limited to exercise participation with a long sustainment tail. The lack of current EW has limited the training opportunities of 5th generation aircraft. Personnel to support EW systems are currently stretched thin, and the addition of new EW threats will bring a larger workload. Some of this workload can be alleviated by the combination of the 255th ACS as well as the Gulfport CRTC.
	Special Operations	●	Special operations training for aircrews has been limited due to the weapons DODEC currently on the AC-130 fleet. While training rounds exist for the 105mm rounds, the smaller ammunition weapons use spotting charges that currently don't meet the threshold for use on inert ranges. Spotting charges are also used on BDU-33/MK-76 practice bombs without exception. The 20mm/25mm class weapons should be looked at closer (practice rounds without spotting charges do not facilitate training).

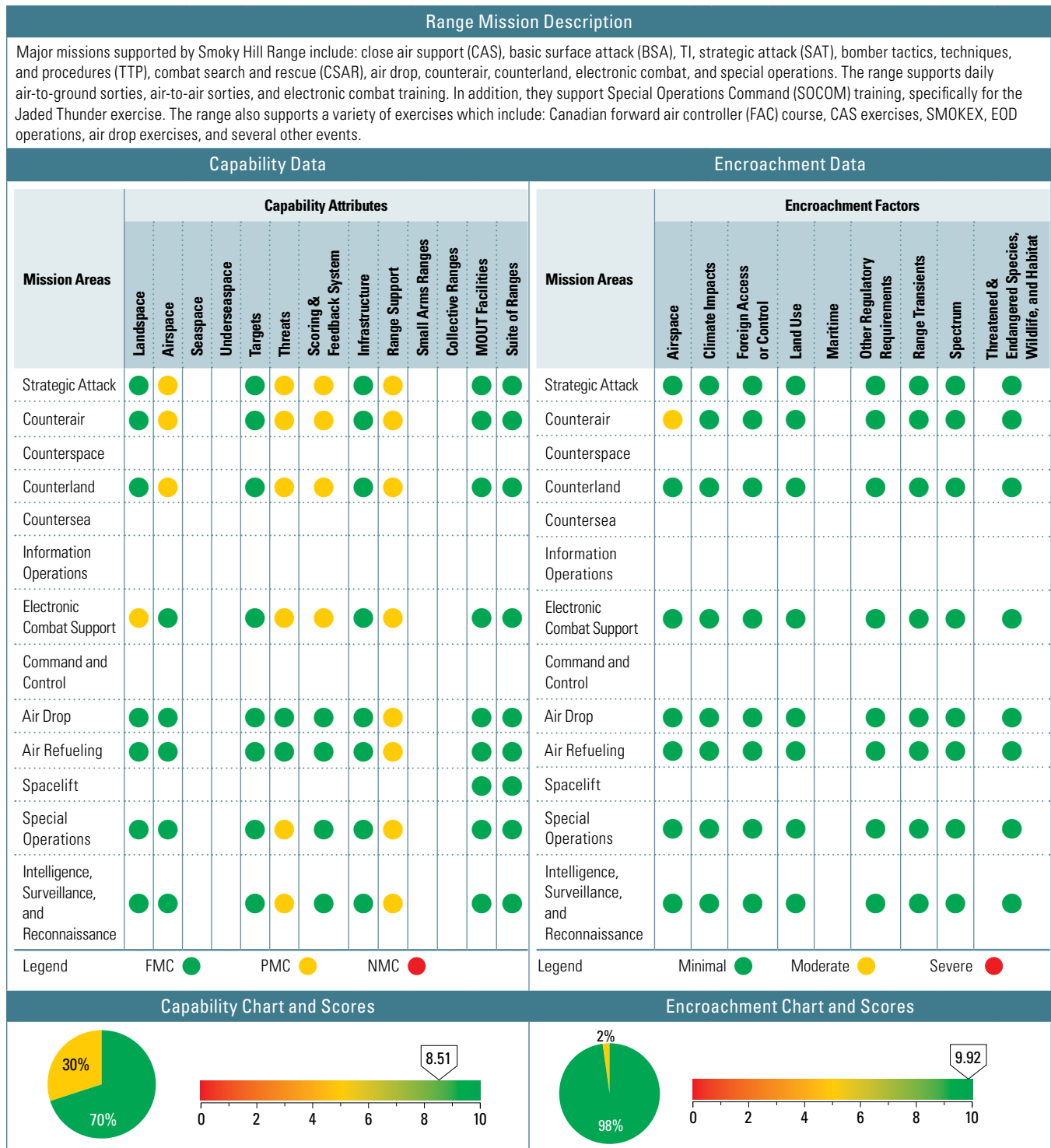
Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)**Shelby Detailed Comments**

Encroachment Observations			
Factors	Assigned Training Mission	Score	Comments
Airspace	Air Refueling	●	Currently the range's airspace is not adequate to support air refueling (AR). There are two AR tracks within 30 minutes (for most tactical aircraft). Anchor AR orbits over the Gulf and provides the easiest solution but careful coordination with the air traffic control (ATC) centers is required for seamless transition to the range. In the past, Altitude Reservations have been coordinated during large force exercises. A more permanent solution could be explored for the transition from the Gulf warning areas to the range restricted areas.
	Strategic Attack	●	The range's proximity to Eglin and Tyndall training areas causes overlap in frequency assignments. Threat emitter frequency authorizations are limited and subject to a lengthy approval process. This limits Situational Awareness Data Link (SADL) operations and results in occasional frequency overlaps. SADL use must be coordinated with the Joint Gulf Spectrum Manager prior to use, with limited frequencies and power settings. Radio frequency overlaps are coordinated with the NGB Spectrum Manager for frequency reassignment.
Spectrum	Information Operations	●	The primary network used at the range is based on a microwave link. While the bandwidth for the link is adequate for today's needs, its stability occasionally suffers. The inability to have a more normal fiber connection leaves the range without network (NIPR, Telephone, RADS) capability on occasion. While the next generation architecture is still a moving target in terms of capability versus requirement, there are a variety of commercial business solutions that may provide an alternative.

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Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Smoky Hill Assessment Details



Smoky Hill Assessment Details

Summary Observations							Summary Observations						
There are three issues impacting the range's capabilities: airspace, old/ antiquated threat replication, and range instrumentation. The airspace has not evolved with weapons' capabilities. In addition, there is no instrumentation system at Smoky Hill and this impacts aircrew in their ability to effectively debrief; particularly after air-to-air engagements but also after land attack missions. Acquiring a ground station for P-5 pods would improve capability and allow the range to have a data network that could support use of synthetic environments. With flying hour shortfalls, the simulated environment will be the stop gap. Advanced threats will be tied into all for scoring and feedback; they are all co-dependent.							Internal encroachment from the active duty Army is currently deemed the biggest encroachment issue at Smoky Hill Range. Wind energy is also becoming an issue, especially with regards to radar impacts.						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	9.85	9.85	9.85	10.00	10.00	10.00	Encroachment Scores	10.00	10.00	10.00	10.00	10.00	9.85
Smoky Hill's capabilities have grown in some areas such as: targets, IR threats, MOUT facilities, and some range support. In other areas, capabilities have decreased. Examples include: range manning cuts, EW threats becoming obsolete, communications infrastructure becoming obsolete, and the airspace not being able to support advanced weapons and platforms. Overall, Smoky Hill's capabilities are decreasing, primarily due to attrition. The range's infrastructure has not kept up with advancing weapons technology. With the advent of fifth generation fighters with low observability (LO) capabilities (stealth) and weapons that need much greater standoff distances to maximize their benefits; the training environment has not been properly upgraded. The range's fiber optic shortfall has resulted in the range being unable to connect to the simulated environment.							Encroachment is on the rise. Encroachment from both the Army and wind energy development are growing. Fort Riley has a need for more training space for tracked maneuver (unknown quantity). Smoky Hill has been discussed as an outlet for this training. This training would likely have a negative impact on the AF's ability to conduct training at the range. Otherwise, the range is in good shape regarding cultural encroachment (development).						

Smoky Hill Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Electronic Combat Support	●	Range is only about 10 miles long by about five miles wide, which does not support EW threats with enough stand-off distance. The threats are at fixed locations so identifying the source is neither realistic or challenging to aircrews. Aircrews don't get realistic training due to the predictability of the threat locations. One solution would be to acquire land use agreements to site a mobile threat emitter on either Federal or State property or privately owned land.
	Strategic Attack	●	The range's airspace is too small to provide adequate opposition forces, "Red Air." Aircrews, specifically fighter aircraft, do not get the standoff they need to receive quality training. An airspace expansion project is underway
Airspace	Counterair	●	The range's airspace is too small to provide adequate opposition forces, "Red Air"; to execute Advanced Medium Range Air-to-Air Missile (AMRAAM) TTPs; and to support large force exercises and integrated missions. Aircrews, specifically fighter aircraft, do not get the standoff they need to receive quality training. They cannot conduct the graduate level type training that is only achieved at the larger ranges. Therefore, units must travel to bigger ranges to accomplish these training objectives. An airspace expansion project is underway.
	Counterland	●	The range's airspace is too small to provide adequate opposition forces, "Red Air." Aircrews, specifically fighter aircraft, don't get the standoff they need to receive quality training. An airspace expansion project is underway

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Smoky Hill Detailed Comments

Capability Observations			
Attributes	Assigned Training Mission	Score	Comments
Threats	Strategic Attack	●	The range's EW threat system is old and antiquated MUTES. Also, the threat system is fixed (not mobile). Aircrews receive threats that are not realistic and new equipment (e.g. High Speed Anti-Radiation Missile Targeting System pods) can tell the difference. There is also no feedback provided for the aircraft countermeasures effectiveness. New threat systems are being developed, e.g., Advanced Radar Threat Systems. Also, the range has a Tactical Radar Threat Generator (TRTG); however, it is very limited in standoff distance and threat choices. IR threat capability is strong, as the MAST is providing good results.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance, and Reconnaissance	●	Same as above.
Scoring & Feedback System	Strategic Attack	●	Range lacks instrumentation to provide feedback to aircrews. Debrief from the range is near impossible without instrumentation. Aircrews rely on debriefing using on-board resources (e.g. heads-up display recordings). The range is working with the ACMI working group to bring instrumentation to the range to address the issue.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Electronic Combat Support	●	The range's EW threat system is old and antiquated MUTES. Also, the threat system is fixed (not mobile). Aircrews receive threats that are not realistic and new equipment (e.g. High Speed Anti-Radiation Missile Targeting System pods) can tell the difference. There is also no feedback provided for the aircraft countermeasures effectiveness. New threat systems are being developed, e.g., Advanced Radar Threat Systems. Also, the range has a TRTG; however, it is very limited in standoff distance and threat choices. IR threat capability is strong, as the MAST is providing good results.
Range Support	Strategic Attack	●	The range lacks fiber optic connectivity and manning cuts have impacted the range. The lack of fiber optics prohibits the range from connecting to synthetic environments such as the JTAC simulator and networks are slow and cumbersome. Additional manning cuts or mission increase will lead to degraded mission effectiveness. There has been a fix in the works for years and a contract has been let to bring fiber to the range but this has still not occurred. No proposed solution for manning.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Air Drop	●	Same as above.
	Air Refueling	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance, and Reconnaissance	●	Same as above.

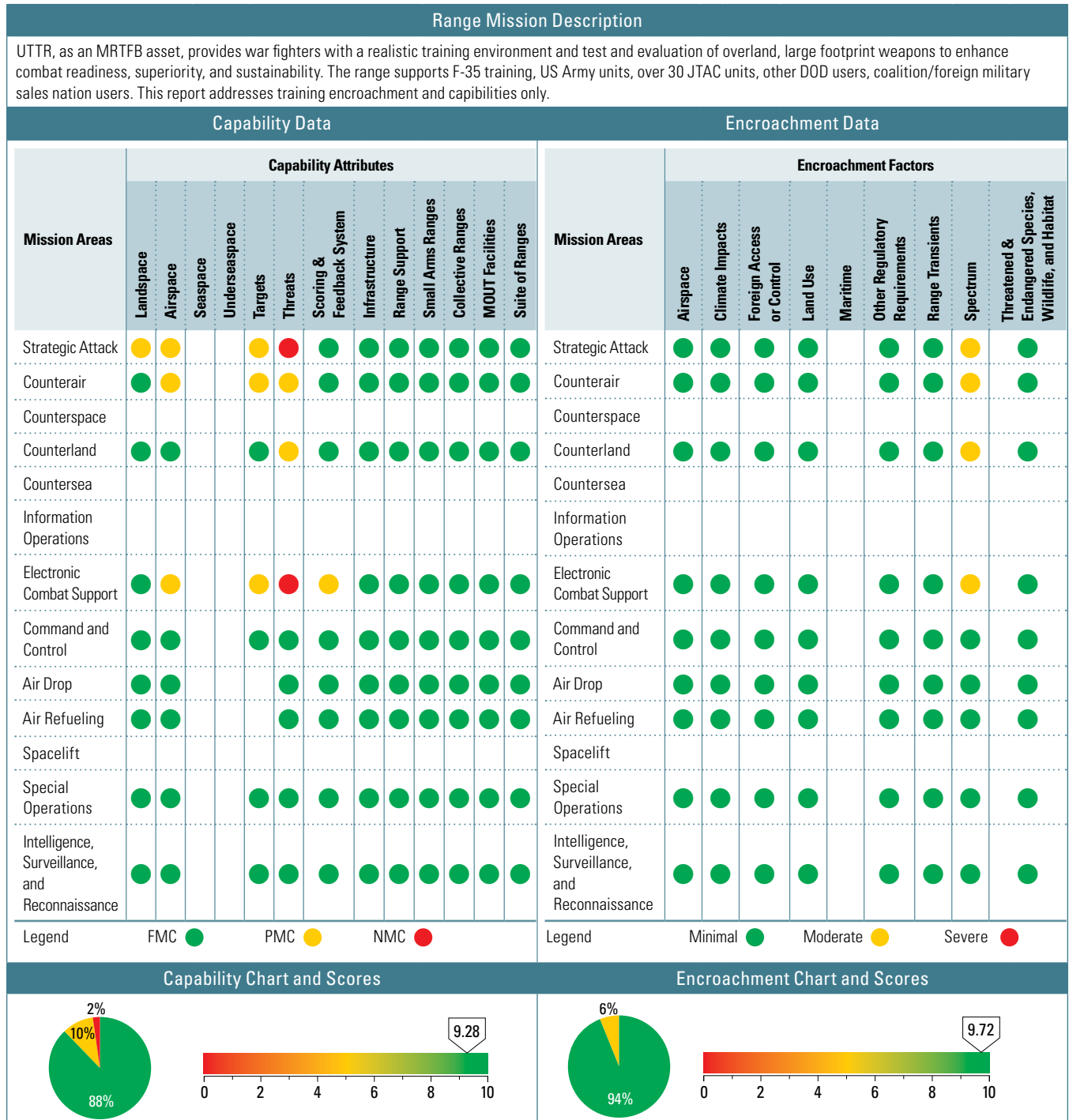
Encroachment Observations

Factors	Assigned Training Mission	Score	Comments
Airspace	Counterair	●	Wind farms negatively effect air-air and air-ground radar. Wind turbines produce clutter on radar, skewing an otherwise pristine training environment. The range will continue to engage wind energy developers to ensure that their projects do not negatively impact the range's SUA or ability to provide required training.

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Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Utah Test and Training Range (UTTR) Assessment Details



Utah Test and Training Range (UTTR) Assessment Details

Summary Observations							Summary Observations						
<p>UTTR capabilities, as a result of F-35 Initial Operational Capability (IOC) and work to reach Full Operational Capability (FOC), are updated and discussed in order of priority. UTTR threat capabilities are currently the greatest limitation to 5th generation training capability; the limitations affect strategic attack, electronic combat support, counterland and counterair (OCA-AI), in order of severity. UTTR airspace minimally meets fifth generation training requirements and results in marginalized training for F-35 users; the limitations affect strategic attack, counterland, counterair, and electronic combat support, in order of severity. UTTR landspace is partially mission capable, specifically as advanced weapons/tactics require greater employment distances, the effective landspace shrinks. Small diameter bomb all-up round training is not available (T&E employment with a flight termination system only); limitations affect strategic attack, but have some impact to counterland, and counterair (OCA-AI), in order of severity. UTTR scoring and feedback systems (debrief systems) are partially mission capable, specifically they do not currently include any threat debrief information resulting in marginalized training for the fifth generation range users; limitations affect electronic combat support, strategic attack, counterland, and counterair, in order of severity. UTTR targets are partially mission capable, specifically current targets are low to medium fidelity and advanced sensors/tactics require higher fidelity targets (medium-high fidelity). Limitations affect strategic attack, counterair (OCA-AI), and counterland, in order of severity.</p>							<p>Encroachment at the UTTR is grouped into three major areas, physical, spectral and environmental/regulatory. Spectral encroachment currently has the greatest impact to UTTR training missions. Spectral encroachment on UTTR has a moderate impact on the range's ability to support its training missions and represents UTTRs first priority to address. Frequency sell-offs, congestion in available spectrum (DoD on DoD and Civilian on DoD requirements), wind turbine proliferation and rapid expansion of broad band capabilities are limiting operational use of training threat systems and GPS jamming training. The spectral encroachment most impacts strategic attack, electronic combat support, counterland and counterair (offensive counterair-air interdiction [OCA-AI]), in order of severity.</p>						
Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	9.89	9.89	9.89	9.55	9.55	9.64	Encroachment Scores	9.83	9.83	9.83	9.55	9.55	9.78
<p>UTTR training capabilities have evolved primarily due to the mission requirements of being the first USAF F-35A operating location and advanced weapon, sensor and tactic development. The future projections for specific capability areas are discussed in order of priority. UTTR threat capabilities are projected to increase over the next six years with stable funding. Future threat capability upgrades include the addition of MUTES, Mini-MUTE threat systems, Digital Integrated Air Defense Simulator, Joint Threat Emitters, and ARTS V1 and V2. UTTR airspace capability is projected to increase over the next three years in support of fifth generation training requirements. The re-classification of the Lucin ALTRV to a MOA and addition of a Lucin ATCAA will greatly increase UTTR's airspace capabilities in the near term. Additional airspace initiatives will be researched to meet requirements in the long term. UTTR landspace capability recently increased with the permissive use of 700,000 additional acres for up to 100 hours per year. This incredibly generous increase in capability assists in meeting near-term requirements, but the long-term requirement for land will continue to grow. Long-term capability requirements will necessitate additional mitigations or investment in flight termination systems for evolving long range weapons. UTTR scoring and feedback systems (debrief systems) in the near term will be reconfigured to include threat data and enhance debrief capabilities. Long-term investment in fifth generation compatible operational training infrastructure (to include the live, virtual and constructive domains) debriefing systems will be critical to prevent a decrease in capability. UTTR target capabilities are projected to increase over the next five years with stable funding. Long-term increases in full spectrum target fidelity and density must be achieved through advanced technologies such as an operational training infrastructure (to include the live, virtual and constructive domains) not just expensive high fidelity live targets.</p>							<p>Spectral encroachment remains the single biggest threat to the training mission on the UTTR. Wind turbine development commercially and by DoD agencies will adversely impact training missions. Aggressive avoidance/mitigations must continue to avoid mission failure. The requirement for threat systems has dramatically increased to enable the F-35 destruction of enemy air defenses (DEAD) mission. Threat frequencies are being encroached upon by numerous technology evolutions which must be mitigated to avoid mission failure. Spectral encroachment will continue to increase for the foreseeable future.</p>						

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Utah Test and Training Range (UTTR) Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Strategic Attack	●	Advanced weapons/tactics require greater employment distances which effectively shrinks the landspace. Small diameter bomb (SDB) type all-up round (AUR) training is not available (T&E employment with a flight termination system (FTS) only). Land required to enable SDB AUR may never be available. Funding of additional training resources with FTS would be required. No resolution date.
Airspace	Strategic Attack	●	UTTR airspace minimally meets fifth generation strategic attack training requirements. Advanced weapons/tactics require additional airspace to provide realistic training for F-35 users. Airspace actions to recategorize some airspace and add additional ATCAAs is in progress. Resolution date is 2018.
	Counterair	●	Same as above.
	Electronic Combat Support	●	Same as above.
Targets	Strategic Attack	●	UTTR targets are partially mission capable for strategic attack training missions. Current targets are low to medium fidelity and advanced sensors/tactics require higher fidelity targets (medium-high fidelity). POM submission for additional target funding is in progress. Resolution date is 2019.
	Counterair	●	Same as above.
	Electronic Combat Support	●	Same as above.
Threats	Strategic Attack	●	UTTR threat capabilities are not able to meet all the required training tasks for strategic attack because of the F-35 DEAD mission requirements. F-35 DEAD missions require a more advanced and dense threat environment than currently available. POM submission for additional threat funding/capabilities is in process. Resolution date is 2023.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.
Scoring & Feedback System	Electronic Combat Support	●	UTTR scoring and feedback systems (debrief systems) are partially mission capable for electronic combat support. Debrief capabilities do not currently include any threat debrief information resulting in marginalized training for the fifth generation range users. Systems are being funded/reconfigured to include threat data in mission debrief. Resolution date is 2018.

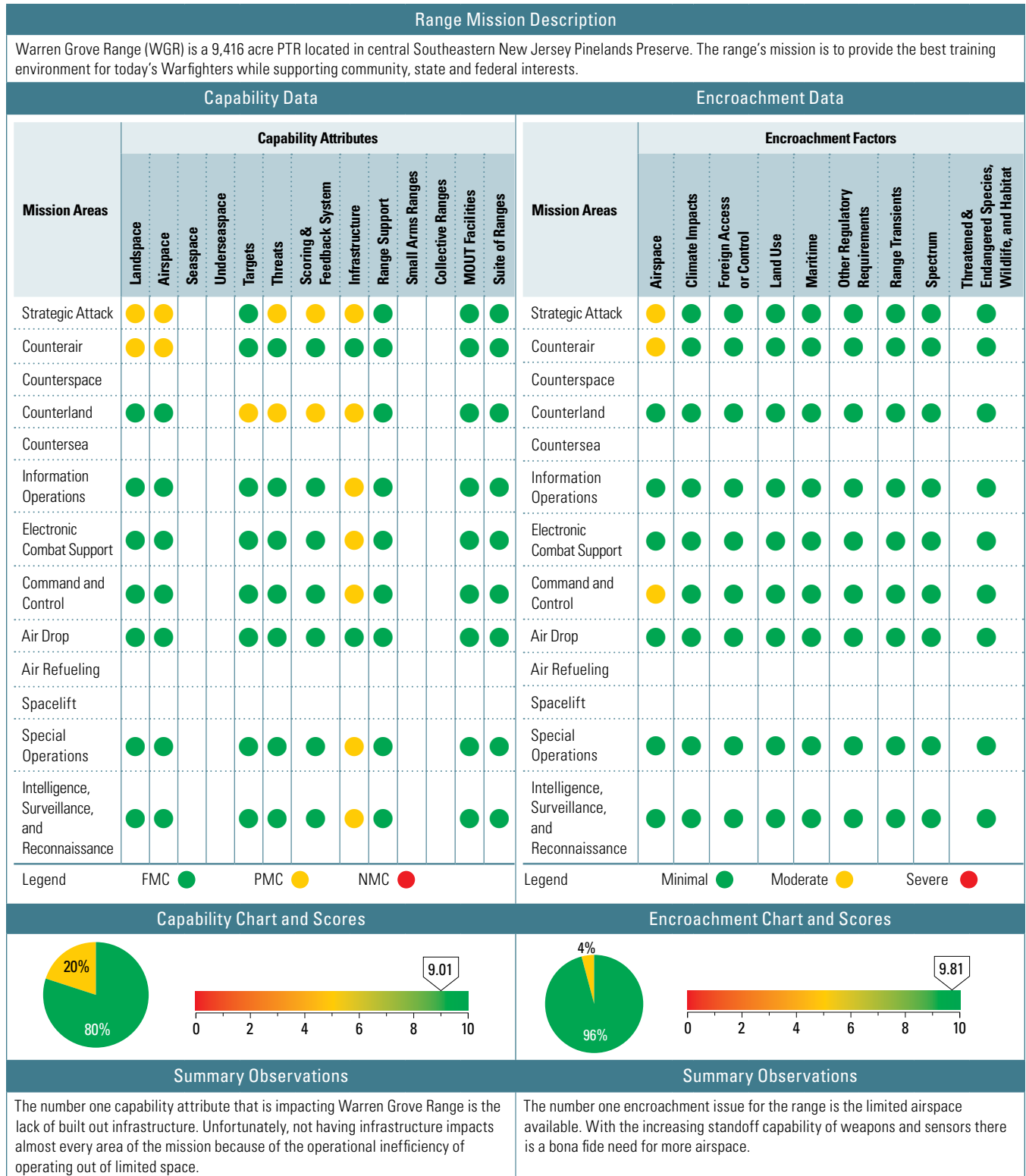
Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Spectrum	Strategic Attack	●	Spectral encroachment on UTTR has a moderate impact on the strategic attack training mission. Frequency sell-offs, congestion in the available spectrum (DoD on DoD and civilian on DoD requirements), wind turbine proliferation and rapid expansion of broad band capabilities are limiting operational use of training threat systems and GPS jamming training. Advanced technology mitigations to take full advantage of the available spectrum and defense of remaining spectrum (especially for threat use) will be critical to minimizing the spectral encroachment impacts. There is no resolution date.
	Counterair	●	Same as above.
	Counterland	●	Same as above.
	Electronic Combat Support	●	Same as above.

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Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)

Warren Grove Assessment Details



Warren Grove Assessment Details

Historical Information, Results, and Future Projections							Historical Information, Results, and Future Projections						
Calendar Year	2008	2009	2010	2011	2012	2015	Calendar Year	2008	2009	2010	2011	2012	2015
Capability Scores	N/A	N/A	9.81	8.02	8.02	9.27	Encroachment Scores	N/A	N/A	9.74	9.44	9.44	9.85
Capabilities at Warren Grove Range have slightly decreased over the past few years. This is in part related to the lack of infrastructure and the delay in getting this issue remedied. The unit acknowledged that some of the critical facilities were in need of overhaul or replacement in the near future and investment was halted in areas that were not going to provide a long term benefit to the mission. Subsequent challenges with obtaining funding for facilities have forced unforeseen delays. For example, Warren Grove was programmed to receive a new control tower in FY2012. The new tower would have the ability to store information and equipment that was previously not possible. Due to the impending construction, the unit chose not to retrofit new equipment into a tower that was being demolished. Unfortunately, the project timeline slipped for the next three years due to a funding limitations. Since then, the project has been funded and should be awarded shortly. The range also lost the ability to have a reliable moving target due to a support contract dispute at the MAJCOM level. By waiting for resolution, the range will be able to obtain a more reliable moving target once the new tower is constructed. These are both examples of the range needing to accept smart, short term limitations to ultimately meet the mission needs in a fiscally responsible manner.							Encroachment pressure has been successfully managed in the past few years. This is in part due to the unit's aggressive community outreach program. The unit also proactively engages the local civil flying community and the FAA to maintain relationships and educate the public about local military activity. In order to proactively solve the airspace concerns, there are two airspace initiative that WGR is pursuing. One is to increase the altitude of the restricted airspace from 3,000 feet to 14,000 feet on the western border. This is a priority due to the high number of incursions along the border and the safety of flight issues involved with such incursions. The second initiative is to create an area of protected airspace that will connect W-107 with R-5002. This airspace would only be required to be active for a few weeks a year and would greatly enhance counterland training.						

Warren Grove Detailed Comments

Capability Observations

Attributes	Assigned Training Mission	Score	Comments
Landspace	Strategic Attack	●	The range has a limited capability to allow the employment of precision guided weapons due to lands space required to contain such a weapon if it malfunctions. This area required is identified in the WDC Tool. Aircraft delivery parameters are limited and at times do not present a valid representation of what a pilot would see in combat. The Commander has requested the host base Real Property Office to investigate the possibility of entering a joint-use property agreement with adjacent government owned property. This is a common action at multiple ranges and would have a minimal impact on surrounding government property. The range has been advised that this could take up to five years to complete.
	Counterair	●	Same as above.
Airspace	Strategic Attack	●	The current range airspace shape and volume limits realistic training scenarios with standoff weapons. There is currently only one attack axis for precision guided weapons from a level delivery. This limits the number of realistic training scenarios for aircrew. The Wing Airspace Manager will submit an airspace initiative to expand the airspace in the critical areas in FY2017.
	Counterair	●	Same as above.
Targets	Counterland	●	The range currently does not have an operable mobile target for live fire. There is currently no way to fulfil the Ready Aircrew Program (RAP) events of moving target strafe and moving target Laser Guided Bomb for the F-16 or A-10. The range has requested the purchase of a remote mobile target that will fulfill these mission needs through NGB and the host wing unfunded process. This mission shortfall will be resolved when the mobile target is funded.
Threats	Strategic Attack	●	The range only has one radar threat emitter and it can only simulate a single threat. Pilots are not exposed to the variety of threats that they would experience in combat. This is a common problem for most smaller ranges in the DoD. There are currently no known fiscally feasible solutions or resolution date.
	Counterland	●	Same as above.
Scoring & Feedback System	Strategic Attack	●	There are currently no LVC training capabilities at the range due to not having the infrastructure or hardware to support it. The flying training environment is not able to provide the pilots additional system feedback to reinforce training scenarios. Once the facilities at the range are able to store the appropriate level of classified information, an acquisition means will be pursued for the required equipment to provide a LVC training environment. Estimated resolution date is FY2020.
	Counterland	●	Same as above.

Figure 3-36 Air Force Capability and Encroachment Assessment Detail (continued)**Warren Grove Detailed Comments****Capability Observations**

Attributes	Assigned Training Mission	Score	Comments
Infrastructure	Strategic Attack	●	The range is currently forty-eight percent underbuilt according to the Air National Guard space standards. Not having the authorized Target Fabrication facility, Vehicle Maintenance facility, or an adequate Control Tower has limited the range's ability to provide the desired quality and quantity of training for the range users. Not having an adequate vehicle entrapment area, facility entrance, or assigned Security Forces exposes assigned personnel to outside threats. The range's facilities shortfalls have been brought to the attention to host wing facility board and will be competitively aligned with the other facility needs on base until all range facilities are adequate. Estimated resolution date is 2024.
	Counterland	●	The current main tower and communications suite is antiquated and in need of replacement by a building of greater functional configuration, visibility, and cost-effective construction. A package was submitted to the base civil engineer for construction of a new main tower, but construction of the facility is currently unfunded.
	Information Operations	●	Same as above.
	Electronic Combat Support	●	Same as above.
	Command and Control	●	Same as above.
	Special Operations	●	Same as above.
	Intelligence, Surveillance, and Reconnaissance	●	Same as above.

Encroachment Observations

Factors	Assigned Training Mission	Score	Comment
Airspace	Strategic Attack	●	The range's current airspace shape and volume limits realistic training scenarios with standoff weapons. There is currently only one attack axis for precision guided weapons from a level delivery. This limits the number of realistic training scenarios for aircrew. The Wing Airspace Manager will submit an airspace initiative to expand the airspace in the critical areas in FY2017.
	Counterair	●	Same as above.
	Command and Control	●	Same as above.

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Table 3-12 Air Force Range Capability and Encroachment Assessment Comparison

Range Name	Capability Score	Encroachment Score
Adirondack		
Airburst		
Atterbury		
Avon Park		
Barry M. Goldwater Range		
Blair Lake		
Bollen		
Cannon		
Claiborne		
Dare County		
Draughon		

Table 3-12 Air Force Range Capability and Encroachment Assessment Comparison (continued)

Range Name	Capability Score	Encroachment Score
Edwards Flight Test Range	9.26	9.11
Eglin Test and Training Complex (ETTC)	7.78	7.79
Falcon	9.52	9.45
Grand Bay	9.86	9.46
Grayling	9.66	9.38
Hardwood	9.84	9.86
Holloman	7.63	8.29
Jefferson	9.32	9.05
McMullen	7.72	8.98
Melrose	9.54	9.86
Mountain Home	9.71	9.50

Table 3-12 Air Force Range Capability and Encroachment Assessment Comparison (continued)

Range Name	Capability Score	Encroachment Score
NTTR	<p>A horizontal bar chart showing a score of 8.80 on a scale from 0 to 10. The bar is colored with a gradient from red (0) to green (10). The score 8.80 is indicated by a callout box above the bar.</p>	<p>A horizontal bar chart showing a score of 8.81 on a scale from 0 to 10. The bar is colored with a gradient from red (0) to green (10). The score 8.81 is indicated by a callout box above the bar.</p>
Poinsett	<p>A horizontal bar chart showing a score of 9.14 on a scale from 0 to 10. The bar is colored with a gradient from red (0) to green (10). The score 9.14 is indicated by a callout box above the bar.</p>	<p>A horizontal bar chart showing a score of 9.17 on a scale from 0 to 10. The bar is colored with a gradient from red (0) to green (10). The score 9.17 is indicated by a callout box above the bar.</p>
Polygone	<p>A horizontal bar chart showing a score of 7.86 on a scale from 0 to 10. The bar is colored with a gradient from red (0) to green (10). The score 7.86 is indicated by a callout box above the bar.</p>	<p>A horizontal bar chart showing a score of 8.86 on a scale from 0 to 10. The bar is colored with a gradient from red (0) to green (10). The score 8.86 is indicated by a callout box above the bar.</p>
Razorback	<p>A horizontal bar chart showing a score of 9.87 on a scale from 0 to 10. The bar is colored with a gradient from red (0) to green (10). The score 9.87 is indicated by a callout box above the bar.</p>	<p>A horizontal bar chart showing a score of 9.86 on a scale from 0 to 10. The bar is colored with a gradient from red (0) to green (10). The score 9.86 is indicated by a callout box above the bar.</p>
Shelby	<p>A horizontal bar chart showing a score of 9.75 on a scale from 0 to 10. The bar is colored with a gradient from red (0) to green (10). The score 9.75 is indicated by a callout box above the bar.</p>	<p>A horizontal bar chart showing a score of 9.81 on a scale from 0 to 10. The bar is colored with a gradient from red (0) to green (10). The score 9.81 is indicated by a callout box above the bar.</p>
Smoky Hill	<p>A horizontal bar chart showing a score of 8.51 on a scale from 0 to 10. The bar is colored with a gradient from red (0) to green (10). The score 8.51 is indicated by a callout box above the bar.</p>	<p>A horizontal bar chart showing a score of 9.92 on a scale from 0 to 10. The bar is colored with a gradient from red (0) to green (10). The score 9.92 is indicated by a callout box above the bar.</p>
UTTR	<p>A horizontal bar chart showing a score of 9.28 on a scale from 0 to 10. The bar is colored with a gradient from red (0) to green (10). The score 9.28 is indicated by a callout box above the bar.</p>	<p>A horizontal bar chart showing a score of 9.72 on a scale from 0 to 10. The bar is colored with a gradient from red (0) to green (10). The score 9.72 is indicated by a callout box above the bar.</p>
Warren Grove	<p>A horizontal bar chart showing a score of 9.01 on a scale from 0 to 10. The bar is colored with a gradient from red (0) to green (10). The score 9.01 is indicated by a callout box above the bar.</p>	<p>A horizontal bar chart showing a score of 9.81 on a scale from 0 to 10. The bar is colored with a gradient from red (0) to green (10). The score 9.81 is indicated by a callout box above the bar.</p>

4 DoD's Comprehensive Training Range Sustainment Plan

NDAA Section 366(a)(1) required DoD to develop a comprehensive training range sustainment plan. DoD uses a flexible and adaptive planning framework that guides continuing, cooperative, and coordinated range sustainment efforts between the OSD and the Military Services, as well as mechanisms that facilitate cooperation with local, state, and regional governments; other federal agencies; and NGOs. This effort, historically known as the SRI, includes policy, programming, outreach, legislative, and related efforts to address training requirements and long-term access to ranges, airspace, and sea space.

This chapter builds upon the information from the 2017 SRR, and highlights key aspects to meet the requirement in NDAA Section 366(a)(4)(c).

4.1 GOALS AND MILESTONES

DoD has used the following seven goals and milestones since the 2006 SRR to track and evaluate progress of the SRI:

- ▶ Mitigate Encroachment Pressures on Training Activities from Competing Operating Space (landspace, airspace, sea space, and cyber issues)
- ▶ Mitigate Electromagnetic Spectrum Competition
- ▶ Meet Military Airspace Challenges
- ▶ Manage Increasing Military Demand for Range Space
- ▶ Address Impacts from New Energy Infrastructure and Renewable Energy Impacts
- ▶ Anticipate Climate Change Impacts
- ▶ Sustain Excellence in Environmental Stewardship

In 2017, DoD re-evaluated and recast these goals and milestones to reflect the current challenges faced by the

Military Services and to re-focus on direct impacts to military readiness and training at the strategic level. The DoD established the following revised goals and milestones for the 2018 SRR:

- ▶ Sustain a Capable Live Training Domain in a Spatially-Constrained Environment (landspace, airspace, sea space, and cyber)
- ▶ Ensure Military Training Availability and Access to the Electromagnetic Spectrum
- ▶ Manage the Emerging Threat of Foreign Access and Control of Areas Surrounding Training Space

Using these goals as a common framework, each Military Service developed a set of milestones and actions to achieve common objectives. New for the 2018 SRR, OSD included its own strategic milestones and actions in addition to those provided by the Military Services. Tables 4-1 through 4-3 show the status of each milestone. Wherever possible, milestones and actions associated with the previous set of goals were aligned to the revised goals for continuity. Incomplete milestones and actions associated with energy development, climate impacts, and environmental stewardship will continue to be managed by the Department, but will no longer be tracked in this report. Based on annual assessment data, the revised programmatic goals and milestones will be reviewed and updated annually to ensure that DoD continues to effectively address potential future training requirements and constraints.

Table 4-1 Live Training Domain Actions and Milestones

Goal: Sustain a Capable Live Training Domain in a Spatially-Constrained Environment (landspace, airspace, sea space, and cyber issues)

Actions	Milestones	Status	Additional Comments
Office of Under Secretary of Defense (Personnel and Readiness)			
Restore combat readiness of the Joint Force through oversight of live military training ranges, capabilities, and other training enablers.	<ul style="list-style-type: none"> Report to the Congressional Defense Committees on (1) the State of Air Training Ranges, (2) Training Range Inventory, Capacity, and Configuration in Europe, and (3) Military Training Operations in Densely Populated Urban Terrain. Support training requirements to meet combat readiness and interoperability by enabling continued access to ranges and airspace of overseas stationed and rotational forces. 	New	
Build a more lethal force proficient in full spectrum warfare.	<ul style="list-style-type: none"> In concert with the Military Services, ensure that training ranges and other enablers have the capacity and capabilities to support combat realistic training for conflict with advanced adversaries. 	New	
Army			
Review and maintain Installation Range Complex Master Plans (RCMPs).	<ul style="list-style-type: none"> Review and update RCMPs annually for required installations. 	Updated; ongoing	100 percent of required installation RCMPs were updated and approved in 4 th Quarter FY2017.
Execute the Army Compatible Use Buffer (ACUB) Zone Program to protect the military mission and offset training restrictions.	<ul style="list-style-type: none"> Implement ACUBs at installations to protect training, testing, and operations from encroachment effects, permanently protecting acreage of land from incompatible land use. Continue programming validated environmental requirements to support ACUBs during POM 2016–2020. 	Updated; ongoing	Through the end of FY2016, ACUBs have been implemented at 36 locations and more than 315,000 acres of land have been protected from incompatible land use.
	<ul style="list-style-type: none"> Continue development of a consistent and clearly defined ACUB strategy, including metrics for program success and prioritization measures that build on the ACUB Implementation Guidance issued in FY2012. 	Updated; ongoing	The ACUB strategy is a continuous follow-on effort to ensure synchronization with Army strategies and mission priorities.
Develop an EA process to facilitate increased access to restricted airspace in support of UAS training.	<ul style="list-style-type: none"> Initiate two pilot project EAs to adjust SUA in support of UAS training at major training and testing installations. 	Ongoing	Airspace Management Work Group completed its mission to develop a problem statement and initial mitigation methodology in January 2015. Original intent was to initiate follow on Airspace Management Integrated Operations Team in January 2016 to refine Army installation tiered courses of action, develop procedural improvements, and identify needs. Action was delayed due to competing mission requirements. Stakeholders updated February 2016. Restart TBD.
Validate the Regional Collective Training Capability (RCTC) sites.	<ul style="list-style-type: none"> Review and re-validate the RCTC sites (installations) following future stationing announcements. 	Ongoing	The Army continues to review RCTC sites against training loads and capabilities.
Enable Joint Pacific Multinational Readiness Capability (JPMRC).	<ul style="list-style-type: none"> During FY2017-2022 JPMRC capability will execute 2-3 enhanced home station training and 2-3 multinational exercises per year. 	Ongoing	JPMRC will increase readiness while maintaining training capabilities and establish multinational training opportunities for Commanders.
Update the TC 25-1 Training Lands that define doctrinal land requirements.	<ul style="list-style-type: none"> Publish new doctrine by the 3rd Quarter FY2015. Update Army Range Requirements Model to determine Army training land requirements by the 3rd Quarter FY2015. 	Ongoing	Published through the Army Publishing Directorate December 2016. This will be a living document as doctrinal land requirements and training gates evolve.

Table 4-1 Live Training Domain Actions and Milestones (continued)

Goal: Sustain a Capable Live Training Domain in a Spatially-Constrained Environment (landspace, airspace, sea space, and cyber issues)

Actions	Milestones	Status	Additional Comments
Army (continued)			
Review the Army Training Land Strategy (ATLS) for incorporation into the Training Support System (TSS) Facility Master Plan. Prioritize Army training land investments through land acquisition, compatible use buffering, sustainable management, and use of other federal land.	► Coordinate, review, and incorporate training land investment priorities into TSS Facility Master Plan for the FYDP.	Complete	Training land investment priorities were captured in the TSS Facility Master Plan and incorporated in the POM 2018-2022 and POM 2019–2023 builds.
	► Implement an annual review and update process for the ATLS as part of the TSS Facility Master Plan.	Ongoing	An updated version of the ATLS is currently being reviewed and will be included in the FY2016 TSS Facility Master Plan.
Execute Training Land Acquisitions to offset the nearly five million acre shortfall in training land assets.	► Fort Irwin/National Training Center (NTC), California— Open the Western and Southern Training Areas (WTA and STA) for training.	Ongoing	FORSCOM has begun improvements and repairs to the existing trail network in the WTA. Army is conducting a NEPA study to identify training impacts to the natural and cultural resources. Projected partial training operational date of 2020.
	► Fort Polk/Joint Readiness Training Center (JRTC), Louisiana—U.S. Army Corps of Engineers (USACE) complete title work and appraisals of property located in priority expansion areas and initiate formal negotiations with land owners.	Partially Completed	Remaining land holdings (less than 50 acres) have been referred to the Department of Justice. Total acquired lands exceed 42,000 acres.
Marine Corps			
Continue to analyze and assess encroachment, quantitatively and qualitatively, at the installation, regional, and Service levels.	Execute Encroachment Control Plans (ECPs).	Complete	
	Completed ECPs: ► Marine Corps Air Station (MCAS) Yuma ► Marine Corps Air Ground Combat Center (MCAGCC) Twentynine Palms ► Marine Corps Base (MCB) Quantico ► MCAS Cherry Point ► MCAS Beaufort/Townsend Bombing Range ► MCB Camp Lejeune/MCAS New River ► Blount Island Command ► MCLB Albany ► Mountain Warfare Training Center (MWTC) Bridgeport ► MCB Hawaii ► Marine Corps Logistics Base (MCLB) Barstow ► MCB Pendleton ► MCAS Miramar ► Marine Corps Recruit Depot (MCRD) Parris Island	Complete	
	ECPs In Progress: ► MCAS Yuma ► MCIEAST Regional ECP	Ongoing	

Table 4-1 Live Training Domain Actions and Milestones (continued)

Goal: Sustain a Capable Live Training Domain in a Spatially-Constrained Environment (landspace, airspace, sea space, and cyber issues)

Actions	Milestones	Status	Additional Comments
Marine Corps (continued)			
Continue to evaluate, plan for, and execute encroachment partnering opportunities per 10 U.S.C. § 2684a.	Facilitate/support regional inter-agency and inter-governmental partnerships: <ul style="list-style-type: none"> ▶ Western Regional Partnership (WRP) ▶ Southeast Regional Partnership for Planning and Sustainability (SERPPAS) 	Ongoing	
	Execute buffer lands acquisition: MCI National Capital Region <ul style="list-style-type: none"> ▶ Quantico (667 ac.) MCIEAST <ul style="list-style-type: none"> ▶ MCAS Beaufort (3,717 ac) ▶ Townsend Bombing Range (54,536 ac) ▶ MCAS Cherry Point/Piney Island Range (6,248 ac) ▶ Camp Lejeune (19,574 ac) MCIWEST <ul style="list-style-type: none"> ▶ Camp Pendleton (1,817 ac) ▶ MCAS Miramar (410 ac) ▶ Twentynine Palms (3,709 ac) 	Ongoing	
	<ul style="list-style-type: none"> ▶ Established partnership with U.S. Fish and Wildlife Service, State of North Carolina, and encroachment partners in North Carolina to manage endangered species on acquired buffer land to increase species population off-base to reduce training restrictions on-base. 	Ongoing	
	<ul style="list-style-type: none"> ▶ Establish partnership with U.S. Fish and Wildlife Service, and encroachment partners in California to manage endangered species on acquired buffer land to increase species population off-base to reduce training restrictions on-base. 	Ongoing	
	<ul style="list-style-type: none"> ▶ Evaluate opportunities in all Continental United States (CONUS) MCI regions. 	Ongoing	
	<ul style="list-style-type: none"> ▶ Participate in Desert Managers Group. 	Ongoing	
	<ul style="list-style-type: none"> ▶ Utilize/implement Readiness and Environmental Protection Integration (REPI). 	Ongoing	

Table 4-1 Live Training Domain Actions and Milestones (continued)

Goal: Sustain a Capable Live Training Domain in a Spatially-Constrained Environment (landspace, airspace, sea space, and cyber issues)

Actions	Milestones	Status	Additional Comments
Marine Corps (continued)			
Define future requirements for military airspace, current and projected airspace shortfalls, and possible courses of action to mitigate shortfalls at installation, range complex, regional, and Service levels.	▶ Include airspace analysis in RCMPs.	Ongoing	See Table 4-1 for schedule
	▶ Assess airspace requirements and shortfalls in preparation of and submission for Regional Airspace Plans (FY2018). MCIEAST efforts were successful in 2014 to acquire 'controlling agency' responsibilities for the airspace above the Cherry Point ranges as well as airspace over the northern Dare County Ranges extending to FL230 with a capability up to FL290 leading to a more dynamic high altitude training capability over eastern North Carolina.	Ongoing	Preparing the Regional Airspace Plans is an annual requirement (OPNAVINST 3770.2K) for Marine Corps Regional Airspace Coordinators.
	▶ Complete strategic-level assessment of range requirements and shortfalls regarding training land and airspace.	Ongoing	Analysis is ongoing per the Commandant of the Marine Corps (CMC) Planning Guidance 2015; Expeditionary Force 21, Marine Corps Strategic Campaign Plan published in 2014. The Marine Corps is currently updating its reference publication that defines training land and airspace requirements based on new systems.
	▶ Continue to track and evaluate airspace issues and FAA initiatives potentially affecting military activities.	Ongoing	
	▶ Continue to track and evaluate energy development proposals potentially affecting military airspace and training routes.	Ongoing	
	▶ Continue airspace expansion planning for Townsend Bombing Range.	Ongoing	On October 1, 2017, the Commanding Officer (CO), MCAS Beaufort, assumed operational control of the existing Townsend Bombing Range (TBR) complex from the Georgia Air National Guard (GAANG). As part of this process the FAA formally approved the change of Using Agency for the TBR SUA from the GAANG to the CO, MCAS Beaufort. Those changes are now reflected in all applicable FAA publications. Additionally, all required agreements associated with the change in Using Agency and management of the SUA have been signed with the appropriate FAA air traffic service agencies.
	▶ R2507 airspace has been expanded, thereby establishing military restricted airspace over the entire range boundaries.	Completed	

Table 4-1 Live Training Domain Actions and Milestones (continued)

Goal: Sustain a Capable Live Training Domain in a Spatially-Constrained Environment (landspace, airspace, sea space, and cyber issues)

Actions	Milestones	Status	Additional Comments
Marine Corps (continued)			
Define future requirements for land ranges and other areas to support training, current and projected land shortfalls, and possible courses of action to mitigate shortfalls at range complex-, regional- and Service-levels.	<ul style="list-style-type: none"> ▶ Include range requirements analysis in regional and Service level RCMPs. 	Ongoing	
	<ul style="list-style-type: none"> ▶ Facilitate enhanced cross-service utilization of range areas in Regional RCMPs. Strong relationships and an effective network of operating forces' SMEs and range managers provide operational planners and unit-level trainers assistance in identifying non-Marine Corps locations that can support their training requirements. Agility of operating forces' training plans is shifting somewhat to explore newer training venues for revised mission sets that span greater geographic areas. Range scheduling supporting use of other Military Service ranges is often problematic as each service's unit training and pre-deployment training tempos vary and each service-level training responsibilities take primacy over other desired users. Access and transit to other public lands addresses primary requirements to connect Marine Corps installations with other DoD installations and or public lands. 	Ongoing	
	<ul style="list-style-type: none"> ▶ Initiate strategic-level assessment of range requirements and shortfalls re: training land and airspace. 	Ongoing	Preliminary assessment prepared in FY2011; additional studies to further strategic assessment objectives per Expeditionary Force 21, Marine Corps Strategic Campaign Plan, and Defense Policy Review Initiative (DPRI) are ongoing, including OSD-directed Pacific Training Analysis, and Marine Corps assessments of training land requirements in the Pacific region.
	<ul style="list-style-type: none"> ▶ Continue range expansion efforts for MCAGCC Twentynine Palms. 	Ongoing	Final phases of land acquisition underway; to be completed by 2019.
	<ul style="list-style-type: none"> ▶ Continue range expansion planning for Townsend Bombing Range. 	Ongoing	ROD signed January 2014, Phase I and II land acquisition actions complete.
	<ul style="list-style-type: none"> ▶ Conduct strategic land requirements analysis. 	Ongoing	Ongoing analysis per CMC Planning Guidance 2015; Expeditionary Force 21, Marine Corps Strategic Campaign Plan published in 2014. Off-installation transit axis and corridor analysis (OITACA) study commenced in September 2015; Conducted by MCIWEST and I Marine Expeditionary Force (I MEF) to identify and validate an off-installation portfolio of resources for transitory training access. The OITACA study is ongoing with a planned completion date of March 2018.
	<ul style="list-style-type: none"> ▶ Provide strategic and NEPA analysis in order to improve training and readiness opportunities on MCLB Barstow. When completed, Barstow will increase support to combined ground and aviation training operations, provide capability for multiple units to conduct simultaneous training and add flexibility for Marine Corps operational requirements. 	Ongoing	MCLB Barstow has been planning and developing training opportunities with MCIWEST Range and Training Area Management based on demand signal from I MEF units who are seeking space/facilities for training activities. NEPA/National Historic Preservation Act (NHPA) Section 106 consultation is ongoing.

Table 4-1 Live Training Domain Actions and Milestones (continued)

Goal: Sustain a Capable Live Training Domain in a Spatially-Constrained Environment (landspace, airspace, sea space, and cyber issues)

Actions	Milestones	Status	Additional Comments
Navy			
Employ proactive interaction with all Services to sustain installation and range capabilities.	▶ Continue collaboration between NSWC and Training and Education Command to support coordination of SUA use and management of Navy Special Warfare training space.	Ongoing	
Continue to analyze and assess encroachment, quantitatively and qualitatively at the installation and regional levels.	▶ Update Encroachment Action Plans (EAPs), as required. As updated, EAPs are to be published electronically for review by all required Navy stakeholders.	Ongoing	
	▶ Use the Navy Community Liaison and Plans Officers to continuously engage communities where the potential encroachment of installations and land ranges may arise.	Ongoing	
Continue to evaluate, plan for, and execute partnering opportunities per 10 U.S.C. Section 2684a.	▶ Use existing parallel processes to update applicable EAPs and identify all encroachment partnering opportunities for associated Navy training ranges.	Ongoing	
Coordinate an integrated approach to address Service-wide, as well as locally isolated, encroachment issues.	▶ Implement and maintain Navy Encroachment Work Group (EWG) with representatives from the Office of the Chief of Naval Operations (OPNAV), Naval Facilities Engineering Command (NAVFACENGCOM), and Regional Community Planning and Liaison Officers (RCPLOs). Additional Navy representatives will be included on an as-needed basis.	Ongoing	
Define future requirements for military training air space and propose possible courses of action to mitigate or solve air space shortfalls at Navy range complexes.	▶ U.S. Pacific Fleet and United States Fleet Forces (USFF) will continue to identify and assess future Navy training air space requirements annually. Requirements will be based on force structure change, changes in training and readiness standards, and introduction of new weapon systems and missions.	Ongoing	Navy is building an expanded land and airspace proposal for the Fallon range complex. (See Section 1.3 for details).
Air Force			
Develop the Center Scheduling Enterprise (CSE) system and integrate flight scheduling systems with other scheduling systems.	▶ Modify utilization reports to provide a complete and accurate account of airspace and range usage.	Ongoing	FAA granted the Air Force an exemption for the FY2015–2017 annual utilization report to allow for development of CSE as the annual utilization reporting tool. HQ ACC developed an AF Guidance Memorandum (i.e. CSE User's Guide) for MAJCOM/unit implementation beginning FY2018. The guidance memorandum will be incorporated in the AFI 13-201 rewrite, which is expected to be completed in CY2018.
	▶ Use enterprise architecture to institute a streamlined version of CSE.	Ongoing	CSE will be available to all units and may be customized for individual operational requirements. Development goals are to streamline CSE for individual use, interoperability, and system integration between units/ services.

Table 4-1 Live Training Domain Actions and Milestones (continued)

Goal: Sustain a Capable Live Training Domain in a Spatially-Constrained Environment (landscape, airspace, sea space, and cyber issues)

Actions	Milestones	Status	Additional Comments
Air Force (continued)			
Develop the Center Scheduling Enterprise (CSE) system and integrate flight scheduling systems with other scheduling systems. (continued)	▶ Deploy CSE system throughout the Air Force.	Completed	The Air Force has deployed CSE; AFI 13-201 and AFI 13-212v1 mandate its use. The CSE user's guide will standardize utilization reporting and will help establish the CSE as the scheduling system of record.
	▶ Provide a quantitative basis for defending current requirements and developing future needs.	Ongoing	CSE will provide a congressionally mandated annual utilization report. Accurate utilization reporting demonstrates proper stewardship of the limited national airspace and emphasizes the importance of maintaining airspace for AF operations. As the National Airspace System becomes more crowded, maintaining current airspace and airspace for emerging (5 th Gen) requirements will require proper justification.
	▶ Develop an interface between CSE and the Army/Marine Corps Range Facility Management Support System (RFMSS).	Ongoing	CSE development and integration with RFMSS and various Navy scheduling systems is ongoing. Contract support has been funded to assist with CSE integration.
Initiate and develop a comprehensive analysis of all the current Air Force missions, airspace, and ranges within specific FAA Air Traffic Control (ATC) Centers to determine the requirements to meet new missions and to support current operations. This analysis will enable the Air Force to identify requirements and optimal regional airspace configuration to support current missions with significant consideration for NAS efficiency and thoughtful concern for a broad range of stakeholder interests.	<ul style="list-style-type: none"> ▶ Conduct strategic level assessment of regional airspace requirements and shortfalls. ▶ Develop Major Commands (MAJCOMs) comprehensive plan of regional airspace use. ▶ Report on airspace use (ensure optimization of airspace). 	Ongoing	<ul style="list-style-type: none"> ▶ AF/A3TI (previously A3OT) met with military and civilian stakeholders within the FAA's Albuquerque Center (ZAB) ATC responsibility. Due to funding constraints, a Regional SUA Optimization Project (RSOP) will be conducted in multiple phases. A3TI initiated the NEPA analysis for phase one in August 2017 and expects to begin further phases in FY2018-2020. ▶ Phase one will examine the airspace needed for F-16 formal training unit training at Holloman. ▶ Additional phases will build upon phase one and optimize the remainder of ZAB airspace.

Table 4-1 Live Training Domain Actions and Milestones (continued)

Goal: Sustain a Capable Live Training Domain in a Spatially-Constrained Environment (landspace, airspace, sea space, and cyber issues)

Actions	Milestones	Status	Additional Comments
Air Force (continued)			
Complete Nevada Test and Training Range Land Withdrawal Renewal.	<ul style="list-style-type: none"> Finalize LEIS by September 2018. Submit LEIS to Department of Interior (DOI) by November 2018. Submit SECINT/SECAF legislative proposal to Congress by May 2020. 	Ongoing	<p>The current land withdrawal granted in Public Law 106-65 continues through November 5, 2021. Per Federal Land Policy Management Act (FLPMA), the Air Force must submit a Land Withdrawal Case File renewal request to extend the 2,919,890 acres from the DOI by November 2018.</p> <p>Bi-weekly meetings are held to ensure intermediate milestones are achieved and that the renewal is on track to meet all regulatory requirements.</p>
Secure Utah Test and Training Range (UTTR) Land Access Rights.	<ul style="list-style-type: none"> Secure access control rights (up to 100 hours per year) through permissive easements in eight areas of federal and state lands surrounding the UTTR. 	Complete	<p>This issue was effectively addressed with the passing of Title XXX of Public Law 114-328, the National Defense Authorization Act (NDAA) for FY2017, on December 23, 2016. The law mandates that not later than one year after the date of enactment of the Act, the Secretary of the Interior and the Secretary of the Air Force shall enter into a memorandum of agreement to authorize the Secretary of the Air Force, in consultation with the Secretary of the Interior, to impose limited closures of the BLM land ("Utah Test and Training Range Enhancement/ West Desert Land Exchange") for military operations.</p>

Table 4-2 Electromagnetic Spectrum Actions and Milestone

Goal: Ensure Military Training Availability and Access to the Electromagnetic Spectrum

Actions	Milestones	Status	Additional Comments
Office of the Under Secretary of Defense (Personnel and Readiness)			
Prototype technology allowing the training community to achieve increased spectrum efficiency, flexibly, and adaptability.	<ul style="list-style-type: none"> AF and Navy will conduct a live demonstration prototyping a spectrally efficient datalink supporting live training. 	New	The Secure L-VC Advanced Training Environment (SLATE) demonstrated is planned at the NTTR, Fall 2018. Funding for SLATE is via the Spectrum Access Research and Development Program to mitigate DoD's loss of spectrum from AWS-3. Final transition of the SLATE programs is to the F-35.
Army			
Execute an ACUB to protect spectrum at Fort Huachuca, home of the Electronic Proving Ground.	<ul style="list-style-type: none"> Continue implementing the Fort Huachuca ACUB proposal. 	Ongoing	In April 2016, the REPI program announced that Fort Huachuca was the recipient of a \$2.6M REPI Challenge Program Award. These funds are combined with \$10.3M in partner funds.
	<ul style="list-style-type: none"> Monitor and assess the ACUB at Fort Huachuca through the biennial review process. 	Ongoing	
Design new ranges to minimize spectrum competition.	<ul style="list-style-type: none"> Complete the installation of fiber optic cables to support a wireless network and control targetry to minimize electromagnetic spectrum interference on ranges by FY2017. 	Ongoing; delayed	The Army has installed fiber optic cable at approximately 20 installations, however funding constraints and Army program changes have slipped completion to FY2019.
Marine Corps			
Analyze and assess frequency spectrum issues potentially impacting training capabilities at range complexes.	<ul style="list-style-type: none"> Assess operational impacts of frequency encroachment at the range complex level. 	Ongoing	
	<ul style="list-style-type: none"> Incorporate frequency spectrum encroachment analysis and potential mitigation measures into planned ECPs; incorporate updates to existing ECPs. 	Ongoing	See Table 4-1 for schedule.
Navy			
Analyze and assess electromagnetic spectrum issues potentially impacting training capabilities at the range complex and regional level.	<ul style="list-style-type: none"> Update the RCMPs and EAPs to identify and assess electromagnetic spectrum conflicts, shortfalls, and the impacts on Navy training as the documents undergo periodic updates. 	Ongoing	
	<ul style="list-style-type: none"> Advocate for the protection of military frequencies used by range capabilities that could be affected by frequency re-allocation and/or the National Broadband Plan. 	Ongoing	OPNAV N2/N6 leads the Navy-wide efforts to maintain ranges' access to spectrum.
Air Force			
The Air Force, as the DoD's lead for the FAA's joint program, Spectrum Efficient National Surveillance Radar (SENSR), will continue to represent the DoD and coordinate DoD efforts for the SENSR acquisition effort and represent DoD in the SENSR Joint Program Office.	<ul style="list-style-type: none"> Continue to support DoD development of a separate Spectrum Pipeline Plan (Non-SENSR Plan) to assess the reallocation impact to other DoD operations in the 1300-1350 MHz band, which would not be studied under the SENSR Plan, and also assess the potential impact to DoD operations in the SENSR relocation candidate bands. 	Ongoing	Title X of the Bipartisan Budget Act of 2015 - Spectrum Pipeline, requires the identification and reallocation of 30 MHz of federal spectrum from federal to non-federal, or shared use by January 2022 and for auction by July 2024. The SENSR project assesses the feasibility of making the 1300-1350 MHz band available for reallocation to shared federal and non-federal use through updated radar technology to meet this statutory mandate.

Table 4-3 Foreign Access and Control Actions and Milestones**Goal:** Manage the Emerging Threat of Foreign Access and Control of Areas Surrounding Training Space

Actions	Milestones	Status	Additional Comments
Office of the Under Secretary of Defense (Personnel and Readiness)			
Develop and implement guidance for conducting a risk assessment of foreign land control in proximity to training ranges, and collaborate with other federal agencies to obtain additional information on transactions near training ranges.	<ul style="list-style-type: none"> ▶ Establish a process for identifying and assessing risk associated with foreign access and control of properties in proximity to DoD training ranges. ▶ Seek legislative relief that protects DoD locations from the threat of foreign access and control of properties in proximity to DoD training ranges. 	New	DoD is developing the risk analysis process and will continue this assessment through 2018.
Army			
No current actions underway.			
Marine Corps			
Continue to track and evaluate foreign access or control actions potentially affecting military activities.	▶ As needed, the Marine Corps will coordinate with the Military Services and the Office of the Secretary of Defense to identify and mitigate foreign access or control actions potentially affecting military testing, training, and operational activities.	Ongoing	
Navy			
Continue to monitor foreign persistent presence in the proximity of Navy operational ranges to minimize potential adverse effects.	▶ As needed, the Navy will coordinate with the Military Services and the Office of the Secretary of Defense to identify and mitigate foreign access or control actions, including persistent foreign presences, in proximity to Navy operational ranges.	Ongoing	
Air Force			
No current actions underway.			

4.2 FUNDING

NDAA Section 366(a)(3)(C) requires DoD and the Military Services to report on funding requirements associated with implementing range sustainability initiatives. Four categories are used as a frame of reference for reporting training range sustainability requirements. Descriptions and examples of the funding categories are found in Table 4-4 below.

Table 4-5 presents the funding data for FY2017–FY2022. FY2017 actual funded levels are provided as a reference point. Data for FY2018–FY2022 represents the Military Service requirements reflected in the FY2018 Presidential Budget Request. The data for FY2018–FY2022 are estimates for planning purposes and do not reflect actual funding levels.

Table 4-4 DoD Range Sustainment Funding Requirements and Categories

Funding Category	Description	Specific Examples
Modernization & Investment	Research, development, acquisition, and capital investments in ranges and range infrastructure. It includes related items such as real property purchases, construction, and procurement of instrumentation, communication systems, and targets.	<ul style="list-style-type: none"> ▶ Constructing new multi-purpose training ranges at Army installations ▶ Constructing IED Defeat Lanes ▶ Upgrading Small Arms Ranges
Operations & Maintenance	Funds allocated for recurring activities associated with operating and managing a range and its associated infrastructure, including funds dedicated to range clearance, real property maintenance, and range sustainment plan development.	<ul style="list-style-type: none"> ▶ Clearing unexploded ordnance prior to range construction ▶ Implementing CivPay for Range Operators at Army installations
Environmental	Funds dedicated to environmental management of ranges, including range assessments, response actions, and natural and cultural resource management planning and implementation.	<ul style="list-style-type: none"> ▶ Conservation funding for INRMPs and Integrated Cultural Resources Management Plans ▶ Environmental mitigation costs associated with range modernization and range construction ▶ Conducting Range Assessments
Encroachment	Funds dedicated to actions optimizing accessibility to ranges by minimizing restrictions that do or could limit range activities, including outreach and buffer projects.	<ul style="list-style-type: none"> ▶ ACUB program administration and support ▶ Encroachment plans

Table 4-5 Military Service Training Range Sustainment Funding (\$M)

Service*	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022
Army	Actual	Requested	Requested	Requested	Requested	Requested
Modernization & Investment	\$141.7	\$169.1	\$224.0	\$168.0	\$141.2	\$175.7
Operations & Maintenance	\$324.2	\$343.2	\$353.5	\$354.8	\$364.6	\$358.0
Environmental	\$504.9	\$471.2	\$487.6	\$495.9	\$501.3	\$511.6
Encroachment	\$45.4	\$2.8	\$2.5	\$2.6	\$2.6	\$2.7
Army Total	\$1,016.2	\$986.3	\$1,067.6	\$1,021.3	\$1,009.7	\$1,048.0
Marine Corps						
Modernization & Investment**	\$26.8	\$29.1	\$33.1	\$28.0	\$32.8	\$40.3
Operations & Maintenance	\$76.4	\$77.4	\$81.1	\$75.5	\$85.4	\$88.2
Environmental	\$35.7	\$37.6	\$37.8	\$36.8	\$37.5	\$38.2
Encroachment	\$11.1	\$6.7	\$6.9	\$7.0	\$7.1	\$7.3
Marine Corps Total	\$150.0	\$150.8	\$158.9	\$147.3	\$162.8	\$174.0
Navy						
Modernization & Investment	\$78.8	\$81.2	\$96.1	\$80.8	\$90.4	\$91.5
Operations & Maintenance	\$204.1	\$208.7	\$213.8	\$222.2	\$226.5	\$229.2
Environmental	\$30.7	\$28.1	\$29.1	\$29.8	\$30.8	\$30.8
Encroachment	\$27.5	\$28.1	\$28.6	\$29.2	\$29.8	\$30.5
Navy Total	\$341.1	\$346.1	\$367.6	\$362.0	\$377.5	\$382.0
Air Force						
Modernization & Investment	\$118.2	\$218.7	\$228.6	\$264.1	\$202.2	\$240.1
Operations & Maintenance	\$352.0	\$371.4	\$383.2	\$414.4	\$419.9	\$448.6
Environmental	\$70.1	\$70.4	\$73.9	\$75.4	\$77.0	\$78.7
Encroachment***	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Air Force Total	\$540.3	\$660.5	\$685.7	\$753.9	\$699.1	\$767.4
OSD						
REPI Program	\$75.2	\$75.0	\$75.0	\$75.0	\$75.0	\$75.0
DoD						
DoD Total	\$2,122.8	\$2,218.7	\$2,354.8	\$2,359.5	\$2,324.1	\$2,446.4

*Range sustainability programs are fully represented in the Military Services' programming and budgeting processes. Program fluctuations generally reflect the best alignment of resources across competing Military Service priorities based on programming guidance and validated by the Service Chiefs and Department Secretaries.

**Marine Corps modernization funds are a combination of O&M, PMC, and RDT&E funding. While funds may appear under-executed from year to year, some funding is 3 year funding and may appear to be over-execution in later years.

***The Air Force tracks range sustainment-related funding through two channels (A3 and A4) and do not precisely sync with how the SRR defines the four categories. As a result, the Air Force is unable to report on Encroachment funds, as defined in the SRR.

REPI program funds, which are centrally managed by OSD, have been broken out separately from Military Service encroachment funding for more accurate reporting since 2010. REPI funds support buffer initiatives across the Military Services and are allocated by OSD to the Military Services

based on a competitive selection process that considers an assessment of threats, needs, and military priorities. Any Military Service funds budgeted for buffer projects are captured in that Military Services' encroachment lines.

Table 4-6 outlines Military Service explanations for fluctuations of 10 percent or greater from one year to the next. Funding requirements for range sustainability efforts are fully represented in the Military Services' programming and budgeting processes. Program fluctuations often reflect the choices Military Service Chiefs and Department Secretaries

make in accepting risk and balancing their total portfolios across competing priorities in a fiscal environment that continues to increase in austerity. The reasons for those fluctuations and their impacts are highlighted in the table below.

Table 4-6 Funding Fluctuation Explanation

Military Service	Modernization & Investment	Operations & Maintenance	Environmental	Encroachment
Army	Total funding levels fluctuate across the POM due to prioritization of resource requirements within the programming portfolio and the Training Program Evaluation Group. FY2018 and FY2021 are higher than the 2017 Sustainable Ranges Report submission due to buybacks from previous cuts.	These figures are higher than the 2017 Sustainable Ranges Report submission due to increases in Range Operations support. The Army had been taking risk in Range Operations, relying on Borrowed Military Manpower to bridge the gap in funding levels. This course of action resulted in reduced Readiness levels for individual Soldiers and units. The Army is investing more in Range Operations to increase and maintain Readiness across the force.	Figures remain consistent across the POM and with the 2017 Sustainable Ranges Report submission.	These figures are lower than the 2017 Sustainable Ranges Report submission because the Army is taking risk in the ACUB program for higher priority Conservation requirements. ACUB for National Guard installations has been zeroed out and ACUB for Active Army installations took a 75 percent reduction.
Marine Corps	Increases in Modernization accounts beginning in FY2016 reflect resource management decisions to support range expansions at MCAGCC Twentynine Palms, and Townsend Bombing Range to ensure critical replacement/ replenishment of high-use training systems. The Marine Corps has prioritized funding to selectively permit some level of modernization to meet emerging operational requirements tied to scheduled range expansions and to ensure critical replacement/ replenishment of high-use training systems.	The Marine Corps has prioritized funding to ensure the sustainment of current range capability. This projected level of O&M funding will ensure that current range capabilities and capacities are fully sustained across the Future Years Defense Program (FYDP).	Current funding levels provide medium capability for Range Sustainment. Funding supports projects to comply with "just-in-time" range sustainment requirements; however, provides no strategic planning capability or investments in land or infrastructure to reduce risk of encroachment or reduce environmental risk.	The FY2017 variance in encroachment funding is the result of removing REPI OSD funding that was previously included in prior year reporting, and the addition of \$3.4M dollars in encroachment contracts that were previously not counted in FY2012-2017 SRR submissions. There is no significant increase or decrease in the Marine Corps encroachment management capability support that is anticipated.
Navy	No significant difference in funding that was reported in 2017.	No significant difference in funding that was reported in 2017.	Navy tracks range-related environmental funding through its OPNAV N45 Range Sustainment program. Navy cannot report environmental funds as defined in the request.	No significant difference in funding that was reported in 2017.
Air Force	Fluctuations in funding are a result of: reductions due to properly realigning the funds within the Program Element to support R&D and procurement of new and upgraded range equipment; increases to fund the procurement of advanced threat emitters for CONUS and USAFE ranges and Live Mission Operations Centers for CONUS ranges; and both increases and decreases are due to realignment of the Program Element 27429F APAF funds to enable proper execution.	FY2018–2022 increases enable the Air Superiority Core Function Team to properly reflect how Air Combat Command executes backshop maintenance, Air Force Weapons School, mission planning integration, and 5 th generation blue parametric data.	Increases across the FYDP correct /support civilian pay lay-ins and realignment totals for 18 ranges.	

4.3 THE READINESS AND ENVIRONMENTAL PROTECTION INTEGRATION PROGRAM

The Readiness and Environmental Protection Integration (REPI) Program works to protect the military's ability to accomplish its training, testing, and operational missions by helping relieve or avoid land-use conflicts near military installations. The program achieves its mission through projects that promote compatible development; preserve off-installation habitat to address ESA regulations that may restrict use of DoD training and testing lands; and support education, engagement, and regional sustainability and planning efforts. Through the REPI Program, DoD works with stakeholders to find solutions to military-community-environmental encroachment issues, primarily by supporting cost-sharing agreements between the Military Services and private conservation organizations or state and local governments to maintain compatible land uses and preserve habitats important to military installations.

These unique partnerships, authorized by Congress (10 U.S.C. § 2684a) in 2002, acquire easements or other interests in land from willing sellers to prevent incompatible development and loss of important habitat near installations and ranges where the military tests, trains, and operates. By acting proactively, the REPI Program protects investments made to modernize and build range infrastructure and other training, testing, and operating assets, while minimizing spending on more costly alternative training approaches or mission relocations.

OSD manages the REPI Program to develop DoD policies, standards, and to provide oversight and administer congressional funding for authorized projects. In addition, REPI supports stakeholder engagement activities, leads partnerships with shared interests across large landscapes, and works to integrate various tools to enhance interagency initiatives supporting the military mission. REPI is a critical component of DoD's training range sustainment efforts. In light of ongoing budget constraints across DoD and for REPI partners—private and government alike—the REPI Program is pursuing a number of initiatives to create greater program value and flexibility to trainers, testers, and operators.

Sentinel Landscapes

One of the REPI Program's newest and high profile initiatives is the Sentinel Landscapes Partnership with the USDA and the DOI. Sentinel Landscapes are places where preserving the working and rural character of key landscapes strengthens the economies of farms, ranches, and forests; conserves habitat and natural resources; and protects vital test and training missions conducted on military installations that anchor such landscapes. The Sentinel Landscapes Partnership is looking to better align and deliver federal programs to recognize landowners and provide an incentive for their continued

maintenance of these landscapes in ways that are compatible with the nation's defense activities.

In 2017, the Sentinel Landscapes Partnership implemented an application process for future designations. For competitive consideration, applicants were required to demonstrate evidence of advanced planning, engagement, and compatible management strategies to advance mutually beneficial working lands, natural resources, and military mission protection goals. Interested parties submitted applications in March.

After reviewing applications received from locations across the country, the Partnership announced the designation of the Georgia Sentinel Landscape. Spanning a significant portion of the southern part of the state, the Georgia Sentinel Landscape brings together more than 20 partners at the federal, state, and local levels to sustain working farms and forests; protect vital habitat for a number of important species; and promote land uses compatible with the military mission at nine of the nation's most important installations and ranges, including Fort Benning, Fort Stewart, Townsend Bombing Range, Robins Air Force Base, and Naval Submarine Base Kings Bay.

The Georgia Sentinel Landscape joins six other Sentinel Landscapes in this nationwide partnership: Joint Base Lewis-McChord, Washington; Fort Huachuca, Arizona; Naval Air Station Patuxent River-Atlantic Test Ranges, Maryland; Avon Park Air Force Range, Florida; Camp Ripley, Minnesota; and the Eastern North Carolina region. All of these landscapes demonstrate exceptional federal, local, private, and public coordination around protecting the military mission while also preserving rural economies and wildlife habitat at each location.

Across all of the Sentinel Landscapes, DoD REPI Program funds have leveraged over \$50 million from partners since FY2003, including USDA's Natural Resources Conservation Service (NRCS), USFWS, U.S. Forest Service (USFS), BLM, states, local governments, universities, and private organizations. Under the leadership of each anchor installation and key local partners, these funds are providing technical assistance, capacity, and unique job training and research opportunities within the military mission footprint of the seven Sentinel Landscapes. The joint prioritization of funding support and deliberate colocation of efforts will ultimately protect the long-term testing, training, and operational capabilities of the military installations while also protecting the agricultural landscape and achieving partners' species, habitat, and land conservation goals.

Due to the success at designated Sentinel Landscapes, Section 317 of the FY2018 NDAA formally recognizes the Sentinel Landscapes Partnership and makes permanent the temporary authority that permits DoD funds provided pursuant 10 U.S.C. §2684a or the Sikes Act (16 U.S.C. §670c-1) to be used to satisfy the matching fund or cost-sharing requirement of any conservation program administered by USDA or DOI.

The Annual REPI Challenge

In its sixth year, the 2017 REPI Challenge continues to generate partner excitement and innovative ideas to protect valuable lands that support training, testing, and operations. In 2017, the REPI Program awarded \$9.2 million that attracted nearly \$10.1 million in non-DoD partner funding to advance protection of over 17,700 acres. As the REPI Challenge proposals show, the REPI Program is helping to broaden the scale and practices of land conservation across the United States.

The REPI Program designed the REPI Challenge to harness the creativity of the private sector to access and leverage unconventional sources of funding, attract additional philanthropic sources, and take advantage of market based approaches to secure the most land at the least cost. Of the 10 pre-proposals in 2017, the submission by the Eastern North Carolina Sentinel Landscape Partnership rose above and beyond in proposing innovative, larger-scale, and ambitious projects. This partnership represents a coordinated effort between the Army, Marine Corps, Air Force, other federal agencies, state and local governments, and non-profit organizations to protect rural and natural lands important to the Nation's defense mission across 33 counties in the state.

The Marine Corps used the \$5.8 million REPI Challenge award to leverage funding from the North Carolina Wildlife Resources Commission to fund a project known as the Bear Garden project. The funding was used to establish an easement and support management of over 12,100 acres of state-owned land for RCW habitat. The Bear Garden project, in conjunction with other initiatives, will enable Marine Corps Base Camp Lejeune to expand off-base species recovery efforts to nearby state-owned lands dedicated to RCW recovery, reduce the installation's RCW recovery goal, and provide flexibility to further develop ranges and maneuver areas previously encumbered by RCW restrictions. This project will help promote conditions necessary to proceed with the development of new training ranges, expansion of ship-to-shore exercises, and enhancement of tactical tank maneuver areas, as well as ensure operational training realism.

The Air Force will leverage \$3.4 million of the REPI Challenge award with contributions from the North Carolina Agricultural Development and Farmland Preservation Trust Fund to protect more than 5,600 acres of high priority land necessary to maintain viable training airspace for Dare County Bombing Range. Potential barriers to mission training and flight paths include renewable energy compatibility and spectrum encroachment. Dare County Bombing Range is the primary training range for F-15E aircraft crews from Seymour Johnson Air Force Base and the primary backyard range for F/A-18 squadrons operating out of Naval Air Station Oceana. The range is an electronic combat, day-night, and air-to-ground training site critical to multiple installations and Army and Navy special operations teams (including SEALs).

The 2018 REPI Challenge will seek to attract public and private funds for land conservation or management activities that leverage species crediting approaches to relieve current or anticipated environmental restrictions on military testing, training or operations; targeted land conservation within watersheds important to the safe and adequate supply of water to DoD installations and ranges; or the acquisition of water rights that directly sustain or enhance military mission activities as a key element of a land protection project that limits incompatible development or preserves habitat in accordance with 10 U.S.C. 2684a.

Off-Installation Regulatory Solutions

The REPI Program is also looking at innovative ways to use the various authorities Congress has provided to work in partnerships outside our military installations to address the Department's ESA obligations more effectively. To that end, the Department finalized a pilot strategy with the USFWS and state agencies in the Southeast to focus off-base conservation efforts to help preclude an at-risk species from being listed under the ESA, provide regulatory flexibility and predictability related to mission activities, and reduce regulatory pressure on military missions. In December 2017, the USFWS Southeast Region signed the Framework Programmatic Conference Opinion for the DoD Gopher Tortoise Conservation and Crediting Strategy. This represents a new milestone for the strategy and a step closer towards establishing the first gopher tortoise conservation area at Alapaha Wildlife Management Area in Georgia. The USFWS has concluded that effects from the Strategy are not likely to jeopardize the continued existence of the Eastern population of gopher tortoise. Moving forward under the Strategy, participating military installations will be able to work with partners to create gopher tortoise conservation areas, consult with USFWS on project-level activities in a streamlined fashion, and establish and use credits to offset military activities.

4.4 OFFICE OF ECONOMIC ADJUSTMENT COMPATIBLE USE AND JOINT LAND USE STUDIES PROGRAM

Working with communities since 1961, the DoD Office of Economic Adjustment (OEA) has helped communities in all 50 states and several U.S. territories develop comprehensive strategies to adjust to defense industry cutbacks, base closures, force structure realignments, base expansion, and incompatibilities between military operations and local development. OEA's Compatible Use and Joint Land Use Studies (JLUS) Program is the only program that provides direct federal assistance to help states and communities work with the Military Services to promote compatible civilian development in support of military readiness and defense capabilities; protect public health, safety, general welfare, and quality of life; promote the economic viability of the

communities; and foster continued communication among installations and the surrounding communities to address compatibility issues. Technical and financial assistance is available to state and local governments for a Compatible Use or JLUS project to partner with the local military installation to plan and carry out strategies promoting compatible civilian use adjacent to an installation complex, including related ranges, SUA, and associated MTRs and MOAs.

Created in 1985, the JLUS Program brings communities and the military together to study and recommend strategic actions that balance community and military needs. Through a community-driven planning process, adjacent communities and often the state, in partnership with the installation, identify and evaluate a wide range of both existing and potential future encroachment challenges, including compatible siting of energy projects that may impair the continued operational utility of the military installation. The affected communities then develop a strategic action plan to identify specific actions, responsible parties, a proposed timeline, and possible funding sources to address the encroachment challenges. The JLUS planning process benefits both the military and the surrounding communities by identifying existing and future development conflicts, and where mitigation strategies and future planning actions may counter possible civilian development that may impair readiness and continued military operations.

As of October 2017, DoD and its partners have completed 143 JLUS projects. More than 70 projects currently are underway across the country to remedy encroachment and promote compatible civilian development, including projects to promote compatible siting of energy projects in Arizona, New Mexico, and Utah. Some examples of these projects are captured in the following sub-sections.

Fort Carson, Colorado

The Pikes Peak Area Council of Governments is serving as the project sponsor for the Colorado Springs Regional JLUS, projected for completion in March of 2018. The regional JLUS includes the following Colorado Front Range military installations in the Colorado Springs region – U.S. Air Force Academy, Peterson AFB, including Cheyenne Mountain Air Force Station, Schriever AFB, and Fort Carson. The JLUS was initiated in response to House Report 113-446, pages 341-342, accompanying H.R. 4435, the Howard P. “Buck” McKeon National Defense Authorization Act for FY2015.

The City of Colorado Springs and El Paso, Pueblo, Fremont and Teller counties, and over two dozen additional communities are participating in the study. Participating federal and State agencies include the U.S. Forest Service, Federal Aviation Administration, U.S. Bureau of Land Management, U.S. Department of Agriculture – Natural Resources Conservation Service, Colorado Department of Military and Veterans Affairs, Colorado Department of

Transportation, Colorado Parks and Wildlife, and congressional delegation staff.

The Front Range Installations included in the regional JLUS play a strategic and critical role in national defense, using a variety of airspace and ground assets to support military operations, including space and cyberspace, and high speed, low altitude flight exercises that are a key component of aviation training. In addition to the installations, the Front Range units use a variety of airspace and ground assets around Colorado and in neighboring states to support mission operations. MTRs and SUA connect the installations to training areas such as the Pinon Canyon Maneuver Site and ranges located at Fort Carson.

Fort Carson comprises 137,404 acres, including the cantonment and training areas. Fort Carson's 4th Infantry Division trains, deploys, and sustains units and teams for combat, and conducts decisive full-spectrum operations to accomplish Combatant Commander objectives. Helicopter pilots from all over the nation conduct specialized military high-altitude aviation training in mountain training areas along the Front Range and in Eagle County.

The Army conducts small arms qualification and tank, artillery and helicopter gunnery at Fort Carson. The northern range area is a small non-dusted impact area for small arms and the southern area is a large dusted impact area that supports artillery, tank, Bradley, Stryker and other gunnery ranges. Training exercises regularly generate noise from helicopter overflight when it occurs near or outside the range boundaries. Noise and vibrations from weaponry can carry miles outside of the range boundaries. Smoke from fires sparked by training activities and occasional dust can affect adjacent property owners and communities. For years, Fort Carson has engaged in ongoing mitigation activities to address these issues through dust mitigation, range management (e.g., controlled burns), and environmental studies.

Input from citizens and public officials collected as part of the JLUS planning process indicates neighboring stakeholders and community members understand the general nature of regular training impacts and that it is a regular component of Fort Carson's military operational footprint. The Public Affairs Office announces training operations *via* various media outlets when major operations are about to commence. Helicopter training operations, particularly the High-Altitude Mountain Environmental Training (HAMET) program, have been a major focus of outreach over the last five years. Installation representatives have received input from mountain communities west of Fort Carson and held meetings to discuss training routes and impacts with local citizens and community representatives. In response to community input, and in coordination with the Bureau of Land Management and the U.S. Forest Service for operations on public lands, Fort Carson has adjusted training routes, training areas, timing, and other aspects of training. Along the installation boundary, Fort

Carson has used the Army's Compatible Use Buffer program (ACUB) to work with property owners to create conservation easements or partner with other entities to acquire property. Specifically, the Army has worked with large landholders, primarily with El Paso County and Walker Ranch to extend the installation boundary at least two miles outward from the perimeter. Through the Colorado Springs Regional JLUS, local communities and Fort Carson continue to identify opportunities for improving these activities and coordination with partner agencies.

Deliverables from the study effort are expected to include:

- ▶ JLUS final report to identify compatibility issues and recommended actions to address or mitigate
- ▶ Implementation Strategy to Carry Out the JLUS recommendations
- ▶ Public Participation Plan and Outreach Initiative
- ▶ GIS Data Mapping Application that allows the public to spatially view critical planning information such as military operations footprint, municipal boundaries, tax map parcels, water bodies, infrastructure data, zoning information, critical habitats, etc.
- ▶ Website dedicated to informing and engaging the community in the JLUS planning process and promoting land use compatibility with continued military operations

Marine Corps Air Station Cherry Point, North Carolina

Carteret County is the project sponsor for the Marine Corps Air Station (MCAS) Cherry Point JLUS. The JLUS was completed May 2016 and Carteret County continues to coordinate the region's efforts to carry out the JLUS recommendations. The earlier Eastern Carolina JLUS, completed in November 2002, focused only on MCAS Cherry Point, and resulted in the City of Havelock adopting a Unified Development Ordinance to guide compatible development. The current JLUS participants include the Counties of Craven, Jones, and Pamlico; City of Havelock; Towns of Morehead City, Newport, Bogue, Emerald Isle, Havelock, and Oriental; and representatives from MCAS Cherry Point. The study area, representing an expansion of the 2002 JLUS, includes MCAS Cherry Point, including the Auxiliary Landing Field (ALF) Bogue, Outlying Landing Field (OLF) Atlantic, and Bombing Ranges BT-9 and BT-11. MCAS Cherry Point supports carrier landing practice, unmanned aerial systems, and ground maneuver training. The MCAS Cherry Point range complex includes Piney Island Bombing Range, whose land and water ranges provide electronic and special warfare training.

The 2016 MCAS Cherry Point JLUS includes an evaluation of additional issues occurring within the study. These issues include expanding regional growth, waterway management and access, expansion of the alternative energy sector, and

height of structures that may adversely impact military flight operations. Tall structures, such as telecommunications towers and commercial-scale wind turbines, light pollution from upward shining bright lights, and medium-to-high density residential development are incompatible land uses that adversely impact military flight paths and training.

The installation has increased concern about the dangers to civilian personnel, especially recreational boaters on the local waterways who pose a known threat to live-training assets. The OLF Atlantic that has had to increase its focus on perimeter safety, and assign more personnel to monitor the boundary. Specifically, installation staff have increased monitoring of perimeter boundaries at ALF Bogue, the Neuse River at MCAS Cherry Point, and the Pamlico Sound around BT-9 and BT-11.

The 2016 MCAS Cherry Point JLUS includes 46 recommendations that represent consensus among stakeholders and provides a coordinated approach to continued regional planning for military/civilian land compatibility. Each recommendation incorporates one or more actions that promote compatible use, prevent further encroachment upon the military mission, mitigate existing incompatibility, and facilitate compatible economic development. Implementing these recommendations requires continued efforts of the JLUS Technical Advisory Committee to oversee execution and ensure the local jurisdictions, the installation, and other interested parties work together to establish procedures, recommend or refine specific actions for member agencies, and adjust strategies over time. The local jurisdictions and military and civilian personnel are required to constantly monitor these strategies and actions to ensure public safety and avoid adverse impacts to training.

Nellis Air Force Base Installation Complex, Nevada

Clark County is serving as the project sponsor for the Nellis AFB Installation Complex JLUS and is currently organizing for the effort. The JLUS will include the entire Nellis AFB installation complex and associated SUA, MOAs and MTRs in Nevada.

The Nellis AFB installation complex includes the Nellis AFB installation, the Nevada Test and Training Range (NTTR), Creech AFB, and associated SUA, MOAs, and MTRs. The Nellis AFB installation is comprised of 14,000 acres and is part of the U.S. Air Force's Air Combat Command. Located approximately 8 miles northeast of Las Vegas, it is home to the U.S. Air Force Warfare Center, 57th Wing, 99th Air Base Wing, elements of the 53rd Wing and 505th Command and Control Wing, as well as more than 52 tenant units and agencies. Nellis AFB provides training for composite strike forces which include every type of aircraft in the Air Force inventory, and is also responsible for operational test and evaluation, as well as tactics development. The U.S. Air Force Warfare Center is the largest and most demanding advanced

air combat training mission in the world. NTTR, including its restricted ranges, comprises about 5,000 square miles, or 2.9 million acres. Creech AFB comprises 2,300 acres, is located about 45 miles northwest of Nellis AFB and adjacent to the NTTR, and is home to the 432nd Wing as an integral part of the U.S. remotely piloted aircraft (RPA) program. Creech AFB employs RPAs 24 hours a day, 7 days a week, and 365 days a year in support of U.S. military and coalition forces worldwide, and is 1 of 2 emergency divert airfields for the NTTR.

As one of the fastest growing regions in the nation, urban development in Clark County presents potential adverse impacts to Nellis AFB installation complex military operations, particularly residential growth in the Town of Sunrise Manor and the City of Las Vegas. A renewed construction boom is pressuring local jurisdictions to consider land uses that are not compatible with military operations, especially north and northeast of Nellis AFB under the approach/departure corridor from Nellis AFB into the NTTR (Live Ordnance Overflight Corridor). Encroachment concerns that could result in further restrictions on training and operations requirements include 1) increased noise complaints from residents; 2) incompatible regional transportation improvements to support urban growth; 3) increased airspace, light, and frequency spectrum encroachment on flight paths, types, timing, and frequency of operations, and future technology and training requirements; 4) anti-terrorism/force protection along the southern boundary of Creech AFB; and 5) wild fires on U. S. Bureau of Land Management lands adjacent to the NTTR.

The JLUS will strengthen the lines of communication between the installation and its neighboring communities so that all parties understand the possible second- and third-order impacts of development decisions and create mechanisms to ensure the exchange of relevant information.

Dabob Bay Training and Testing Range, Washington

Kitsap County served as the project sponsor for the NB Kitsap and Naval Magazine Indian Island JLUS, completed in September 2015, and is organizing to carry out the JLUS recommendations. The study area for the NB Kitsap installations, the Dabob Training and Testing Range, and associated transportation routes, and Naval Magazine Indian Island are those areas in the sphere of influence of Navy operations that are sensitive to incompatible development.

The increase in urban development within the urban growth boundaries, particularly shoreline development along the Hood Canal and the Dabob Bay Training and Testing Range are expected to negatively impact the installations' primary missions. Increases recreational and commercial boat traffic on the Hood Canal could result in increased congestion and noise, and threaten to restrict range operations which require a quiet operational environment.

The Dabob Bay Training and Testing Range falls within waters of Hood Canal, Jefferson County, adjacent to the NB Kitsap facilities. Trident submarines and naval forces use the range for specialized testing and research & development, training, and evaluation purposes. The Dabob Bay Range and MOAs in the waters adjacent to NB Kitsap include over 45 square nautical miles with adjacent tidelands and uplands that serve a variety of uses. The Range also includes five upland parcels, at Bolton Peninsula, Pulali Point, Sylopash Point, Whitney Point, and Zelatched Point. Dabob Bay offers quiet, deep, cold water in close proximity to the secure NB Kitsap – Bangor facility. These features and capabilities are virtually impossible to duplicate in another location.

The 2015 NB Kitsap JLUS recommendations include strategies to mitigate or minimize the impacts to the Dabob Bay Training and Testing Range such as establishing a military influence overlay, strengthening communication practices and working with real estate interests to evaluate real estate disclosure methods.

Concurrent with the completion of the 2015 NB Kitsap JLUS, the Navy acquired an easement of subtidal lands from the State to protect the training environment and Navy operations in Hood Canal and Dabob Bay. This easement would prohibit the construction of commercial or industrial piers in the area.

4.5 DOD NATURAL RESOURCES PROGRAM

DoD's Natural Resources Program enables the military's combat readiness mission by ensuring continued access to the natural infrastructure that supports its ranges and training areas. The Natural Resources Program, including the DoD Components, invested approximately \$300 million in FY2015 to ensure continued access to the 25 million acres of military land, air, and water resources needed to accomplish vital testing, training, and operational activities, and to ensure the long-term sustainability of our nation's priceless natural heritage.

DoD relies primarily on Integrated Natural Resource Management Plans (INRMPs), as required by the Sikes Act (16 U.S.C. §670 et. seq.), to implement comprehensive management programs for the conservation and restoration of natural resources in a manner that supports mission requirements. The Military Services develop INRMPs collaboratively with the US Fish and Wildlife Service (USFWS) and the respective state fish and game agencies and incorporate management requirements of other relevant federal laws and regulations, such as the ESA and Migratory Bird Treaty Act (MBTA).

In FY2004, Congress amended the ESA to recognize the significant contributions that installation INRMPs make to promote the recovery of listed species. The amendment states that where the USFWS or NMFS determines that an INRMP provides a conservation benefit to a species for which critical

habitat has been proposed, the USFWS or NMFS will exclude military lands covered by the INRMP from critical habitat designations. This provision allows installations the flexibility to develop management approaches that support both mission and conservation goals. Since Congress passed the amendment, 55 installations and satellite facilities have used INRMP exclusion based on the amended language for 126 total unique species.

To assist the Military Services, the OSD provides policy, guidance, and oversight on preparing and implementing INRMPs. DoD Instruction (DoDI) 4715.03, Natural Resources Conservation Program, is the Natural Resource Program's primary policy document. In addition, OSD manages the DoD Legacy Resource Management Program, which funds high priority natural and cultural resource projects that benefit mission objectives but cannot be funded by the installation. Since Congress established the Legacy Program in 1991 (10 U.S.C. §2694), DoD has funded approximately 3,000 projects totaling over \$300 million.

Due to safety and security concerns that limit access, many DoD lands are sheltered from development pressures and large-scale habitat loss. As a result, some of the finest remaining examples of rare wildlife habitats are found on military installations. In addition, many types of military training activities and land uses are compatible with threatened and endangered species management. Consequently, these lands are home to more threatened, endangered, and at-risk species per acre than any other federal lands. Currently, DoD manages approximately 400 species listed as threatened or endangered and over 500 species at-risk of needing listing protection. For example, in 1990, the USFWS issued a biological opinion that required protection of the RCW on Fort Bragg, and established a recovery goal of 350 breeding pairs. The consultation agreement required the Army to restrict and modify training, requiring a 500-foot buffer around each tree with a nesting cavity. As a result, the Army had to implement training restrictions that significantly degraded training capability. Since that time, Fort Bragg's conservation efforts, in collaboration with USFWS, have succeeded in all RCW-related training restrictions being lifted. Today, there are 430 breeding pairs at Fort Bragg. However, because the species is still listed as endangered, new range and training land development must consider impacts to the installation's RCW population. This strategy was adopted for all Army installations and other military services with similar benefits.

In 2009, Congress amended Section 103(a) of the Sikes Act to authorize the use of cooperative agreements to maintain and improve off-installation natural resources where doing so may relieve or eliminate current or anticipated restrictions to military activities. This provision allows installation commanders to address some portion of their conservation responsibilities—especially those related to ESA-listed, at-risk,

and candidate species—by supporting natural resources projects off their installations, resulting in installation land being preserved to support military training and testing. DoD's Natural Resources Program has partnered with DoD's REPI Program to develop collaborative, habitat-based projects at a landscape or regional scale that provide installation flexibility by conserving resources outside installation boundaries.

Going forward, DoD's Natural Resource Program will take a strategic approach to work with external and internal (e.g., REPI) stakeholders to support and enhance management efforts that promote mission flexibility by helping prevent species of concern to DoD from being listed, streamlining regulatory processes, and developing initiatives that facilitate species delisting/downlisting.

5 Evolving SRI Activities and Emerging Issues

As DoD's SRI has continued to mature, range capabilities have also developed to meet evolving and shifting encroachment challenges. The following subsections highlight how the SRI is meeting burgeoning challenges.

5.1 NEW SRI-RELATED INFLUENCES AND ACTIONS

DoD continues to build on its approach to manage and address capability- and encroachment-related challenges on its military training ranges. In 2017, USD(P&R) and the SRI Working Integrated Product Team revised the 12 encroachment factors that have been evaluated every 3 years to more accurately address the Department's current encroachment challenges. Those nine new encroachment factors are detailed and evaluated in Chapter 3. In addition, USD(P&R) revised the SRI goals to re-focus on direct impacts to military readiness and training at the strategic level.

DoD's training range sustainment efforts are being implemented to be consistent with congressional interest in the capability of DoD's training ranges. In 2017 and 2018, DoD has responded to a large number congressional requests, conducting the research necessary to complete these requests, along with adjusting DoD's strategic focus on the issues to ensure they are managed appropriately. In 2017, USD(P&R) responded to or provided input on several Congressional requests for reports and briefings on Regional Air Training Ranges and Exercises, National Test and Training Range Improvements, and Counter-UAS technologies. USD(P&R) is also preparing or participating in the development of reports to be delivered in early 2018 on Air Training Ranges in the Department of Defense; Training Range Inventory, Capacity, and Configuration in Europe; Military Training for Operations in Densely Populated Urban Terrain; and the Military Mission Line Moratorium in the Gulf of Mexico. Each of these reports focuses on key capabilities of DoD

training ranges that are either significantly challenged, developing to meet capability shortfalls, or face issues related to encroachment. These reports are produced in addition to the annual SRR, which recently began incorporating information on the training capabilities of Special Operations Forces following Congressional interest that began in 2015 with a report on the Air Force's Melrose Range.

5.2 ELECTROMAGNETIC SPECTRUM

DoD operations—in the air, on land, on and under the sea, in space, and in cyberspace—are fundamentally dependent on use and control of electromagnetic spectrum. Spectrum dependent systems (SDS) and capabilities are utilized to support training platforms (both on-range and off-range). All joint functions, such as movement and maneuver, fires, command and control, intelligence, protection, sustainment, and information exchange, are accomplished with systems that use spectrum. Access to spectrum is essential to conduct electronic warfare (EW) training. The DoD depends on access to spectrum to evaluate and maintain the readiness of our forces. Continued Congressional support to ensure the Department maintains access to spectrum in the future is critical to maintaining force readiness.

As potential adversaries continue to aggressively field electronic attacks and cyber technologies that significantly erode DoD's ability to use the spectrum to conduct military operations, the need to train our forces to deny that use of spectrum increases; the ability to retain use of the spectrum on the battlefield requires access to spectrum for the training community. In addition, advances in potential adversary command, control, communications and computers; ISR; improvised explosive devices (IEDs); and area denial weapon systems require the development, fielding, training, and integration of complex electronic attack, electronic support, and electronic protection technologies—all which require access to spectrum.

In comparing the DoD's use of spectrum in training activities versus real operations, the training community requires access to more electromagnetic spectrum than the forces need during real world operations. In addition to the spectrum needed to support warfighting systems, spectrum is needed to support training-related SDSs that:

- ▶ Replicate the electromagnetic profile that would be presented by an increasingly agile and EW aware adversary force to provide realistic training for U.S. Signals Intelligence and Electronic Attack components
- ▶ Control/coordinate synthetic representations of adversary forces to reduce the cost of training by replacing live elements with synthetic replicas
- ▶ Train EW and spectrum management operations to exploit, attack, protect, and manage the electromagnetic operational environment to achieve the commander's objectives
- ▶ Execute spectrum management, network operations, EW, cyberspace, and intelligence operations
- ▶ Quickly assess and react to mission impacts due to denial of spectrum
- ▶ Improve DoD's ability to deny adversary use of spectrum without degrading use by friendly forces or non-aligned entities; and
- ▶ Exchange ground truth position and other data to support real time casualty assessment and kill notification/removal

Electromagnetic spectrum access to support warfighter training activities continues to be a challenge and any additional loss of spectrum will directly impact DoD's ability to conduct live training. In 2017, the Marine Corps, Navy, and Air Force reported on access to the electromagnetic spectrum as either a critical or an emerging encroachment issue. The Navy reported on the potential for interference of existing transmissions due to renewable energy development, specifically wind turbines. The Army cited spectrum encroachment concerns related to the pending deployment of Terminal High Altitude Area Defense batteries from the 69th ADA Brigade for training at Fort Hood. In addition to loss of spectrum availability, the increased use of spectrum surrounding DoD ranges by the commercial sector degrades ability to train. One example is related to the importance of training in a realistic environment of GPS denial in response to our adversaries developing and implementing GPS and satellite communications jamming capabilities. The ability to train in an environment that replicates the capabilities of U.S. adversaries has become increasingly difficult due to the adverse impacts of such training on surrounding communities. Training exercises associated with Mountain Home AFB

resulted in significant, temporary disruption in civilian and commercial navigation and aviation, affecting nearby communities and agriculture business. Further exercises have been restricted by size, duration, and location to minimize adverse impact, resulting in nonrealistic training and limited ability to execute TTPs.

To address spectrum-related challenges, DoD continues to focus on spectrum efficiency, flexibility, and adaptability to accelerate the fielding of technologies and management tools that enable spectrum sharing and improve access opportunities. The Department is also positioning to increase the agility of DoD spectrum operations, moving toward advanced assignment tools and technology to compress the usage requirements, along with modified policies, regulations, and standards, to enable DoD to exploit improvements to SDS spectrum flexibility and facilitate spectrum sharing. The Department plans to use proceeds from the Spectrum Relocation Fund to prototype a waveform capability designed to meet the training community's needs and cohabitate with Long-Term Evolution (LTE) cellular devices.

5.3 FOREIGN INVESTMENT AND NATIONAL SECURITY

The Department remains focused on the issue of foreign investment activities located in proximity to military training and testing areas. Foreign entities that invest in assets near military training and testing facilities have the opportunity to conduct persistent surveillance and collect information. This presents significant national security and encroachment challenges to DoD. The Military Services are increasingly reporting on this issue in the annual SRR and DoD continues to develop strategies designed to mitigate the impacts to training and testing from foreign investment and national security encroachment.

In 2014, the GAO released a report evaluating the risk to DoD ranges and installations from foreign investment encroachment and the Department's ability to address these risks. DoD concurred with the recommendations stemming from this report. Specifically, DoD is pursuing opportunities to obtain information related to foreign investment and transactions in proximity to DoD mission essential locations from agencies with land management authority. In addition, DoD initiated an effort in 2017 to assess the risk associated with foreign access and control of properties in proximity to DoD ranges and installations. DoD will continue this assessment throughout 2018.

DoD is also considering legislative relief as an avenue to mitigate national security-related encroachment and has engaged the various federal land managers to work together on potential issues related to DoD concerns.

5.4 OFFSHORE ENERGY

In an ongoing partnership with the DOI and BOEM, DoD continues to evaluate energy resource development on the outer continental shelf (OCS) for potential impacts to military readiness. The Military Services conduct a number of mission readiness activities across multiple areas of the OCS. The Navy uses the airspace, sea surface, sub-surface, and seafloor of the OCS for events ranging from instrumented equipment testing to live-fire exercises. The Air Force conducts flight training and systems testing over extensive areas on the OCS. Marine Corps amphibious warfare training extends from offshore waters on the OCS to the beach and inland, and includes subsurface and airspace. The OCS provides unique training and range capability resources critical to DoD testing, training and operations.

In 2015, the Office of the Assistant Secretary of Defense (Readiness) and representatives from the DoD Components worked extensively with the BOEM Office of Strategic Resources to complete DoD's input related to the 2017–2022 Outer Continental Shelf Oil and Gas Leasing Draft Proposed Program. DoD conducted a comprehensive analysis of mission compatibility with offshore oil and gas development in the planning areas included in the 2017–2022 draft proposed program that was finalized and submitted to BOEM in January 2016. In 2017, BOEM initiated a new, out-of-cycle “Five-Year Outer Continental Shelf Oil and Gas Leasing Program” in response to the Presidential Executive Order entitled “Implementing an America-First Offshore Energy Strategy” and subsequent order from the Secretary of Interior. The DoD has started early coordination with BOEM on the new five-year leasing program, and the Department will provide input in response to the new draft proposed program when it is released.

The Department is also continuously working to respond to renewed Congressional interest in oil and gas exploration and DoD's activities in the Eastern Gulf of Mexico. National security and energy security are inextricably linked, and DoD fully supports the development of domestic energy resources in a manner that is compatible with military testing, training, and operations. No other area offers DoD a comparable combination of air and water space to support military testing activities than the Eastern Gulf of Mexico. The complex of eastern Gulf of Mexico operating areas and warning areas provides critical opportunities for advanced weapons testing and joint training exercises. The moratorium on “leasing, pre-leasing, and other related activities” ensures that these vital military readiness activities may be conducted without interference and is critical to their continuation. Emerging technologies such as hypersonics, autonomous systems, and advanced sub-surface systems will require enlarged testing and training footprints, and therefore increased DoD reliance on the Gulf of Mexico Energy Security Act's moratorium beyond

2022. DoD views the moratorium as essential for developing and sustaining the nation's future combat capabilities. The Department is responding to Congress with a report to be delivered in March 2018 describing the military readiness activities in the EGOMEX and the potential impacts expanded oil and gas development could have to those operations.

For geological and geophysical (G&G) surveying in advance of oil and gas development, DoD coordinates with BOEM and industry in an ongoing basis to ensure the survey activities and DoD's offshore training activities are deconflicted. In 2017, DoD re-established a G&G permitting working group following an observed increase in the number of G&G permit applications. The working group enables DoD to efficiently review and respond to permit applications as well as ensure that G&G activities within DoD's offshore operating areas are deconflicted with military activities.

DoD continues to participate in the BOEM-led offshore wind energy commercial planning process, to include participation in several State-Intergovernmental Renewable Energy Task Forces where information is exchanged that will assist BOEM in during its decision-making process. In 2016, and at the request of DoD, BOEM commissioned a study on floating offshore wind technologies, conducted by the Department of Energy National Renewable Energy Laboratory (NREL). The study was initiated to assist DoD in assessing the mission compatibility of this emergent technology with the Department's offshore test and training activities. DoD participated in the study by providing BOEM and NREL with a list of parameters it would need to complete a mission compatibility assessment of an offshore floating wind facility. In 2017, at the request of BOEM, DoD initiated mission compatibility assessments for wind resource areas in both the Atlantic Ocean and off the coast of California, and completed a mission compatibility assessment of wind resource areas surrounding the island of Oahu, Hawaii.

5.5 DOD'S LONG-TERM TRAINING RANGE OUTLOOK

The Department is committed to restoring military readiness while building a more lethal force. Training infrastructure must be prepared to support the demands of our warfighters based on an increasingly complex operating environment. The Department will continue to develop strategies and identify common requirements across the Department to quickly field training capabilities while sustaining training enablers that support modern, representative training requirements across all domains. These strategies will work to address the increasing demand for airspace and ranges, growing competition for use of the electro-magnetic spectrum, and evolving encroachment challenges.

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A Inventory of Ranges and Range Complexes, Special Use Airspace, and Military Training Routes

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Figure A-1 DoD Regional Range Complexes: Northeast

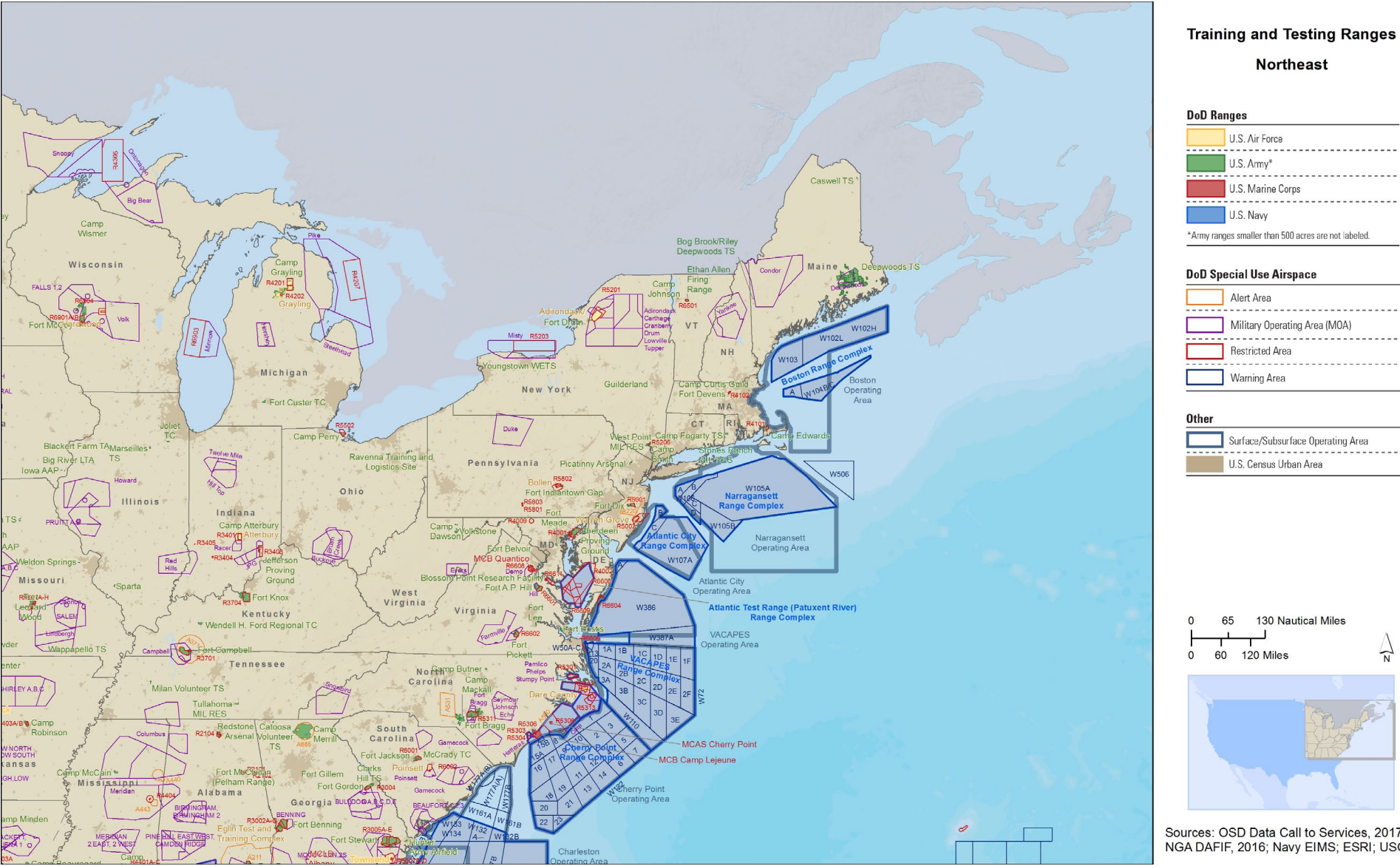


Figure A-2 DoD Regional Range Complexes: Southeast



Figure A-3 DoD Regional Range Complexes: Midwest – North

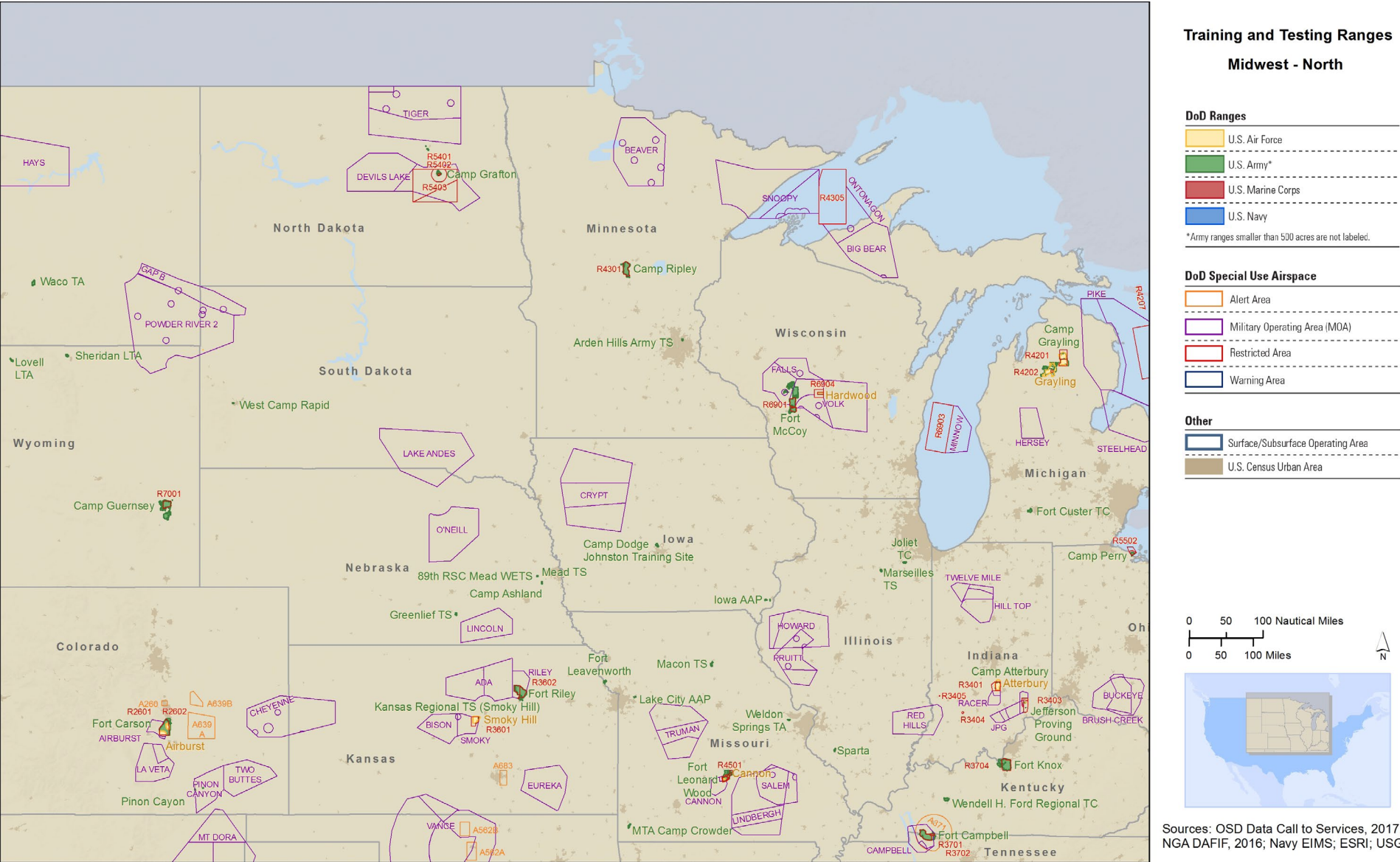
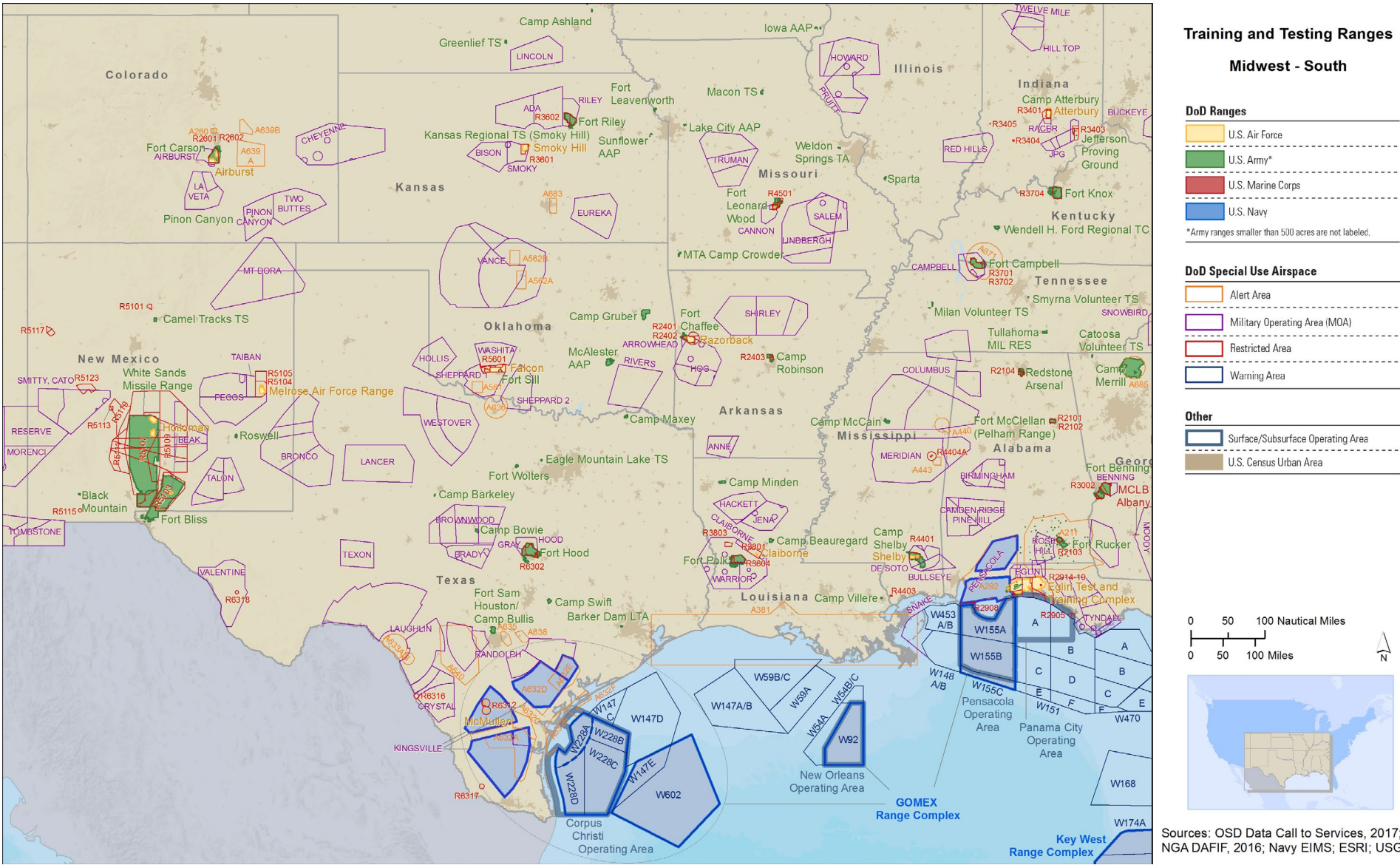


Figure A-4 DoD Regional Range Complexes: Midwest – South





This map illustrates the distribution of military ranges and complexes across the southwestern United States. Key features include:

- Northern California Range Complex:** Located in the northwestern part of California, encompassing areas like W260, W513, W283, W532N, W532E, W537, and W289S.
- Southern California Range Complex:** A large complex in the south, including W291 and W289W.
- El Centro Range Complex:** Situated in the southeastern part of California, including W289E and W289W.
- China Lake Range Complex:** Located in the central-eastern part of California, including W2504, W2506, W2507, W2508, W2509, W2510, W2511, W2512, W2513, W2514, W2515, W2516, W2517, W2518, W2519, W2520, W2521, W2522, W2523, W2524, W2525, W2526, W2527, W2528, W2529, W2530, W2531, W2532, W2533, W2534, W2535, W2536, W2537, W2538, W2539, W2540, W2541, W2542, W2543, W2544, W2545, W2546, W2547, W2548, W2549, W2550, W2551, W2552, W2553, W2554, W2555, W2556, W2557, W2558, W2559, W2560, W2561, W2562, W2563, W2564, W2565, W2566, W2567, W2568, W2569, W2570, W2571, W2572, W2573, W2574, W2575, W2576, W2577, W2578, W2579, W2580, W2581, W2582, W2583, W2584, W2585, W2586, W2587, W2588, W2589, W2590, W2591, W2592, W2593, W2594, W2595, W2596, W2597, W2598, W2599, W2600, W2601, W2602, W2603, W2604, W2605, W2606, W2607, W2608, W2609, W2610, W2611, W2612, W2613, W2614, W2615, W2616, W2617, W2618, W2619, W2620, W2621, W2622, W2623, W2624, W2625, W2626, W2627, W2628, W2629, W2630, W2631, W2632, W2633, W2634, W2635, W2636, W2637, W2638, W2639, W2640, W2641, W2642, W2643, W2644, W2645, W2646, W2647, W2648, W2649, W2650, W2651, W2652, W2653, W2654, W2655, W2656, W2657, W2658, W2659, W2660, W2661, W2662, W2663, W2664, W2665, W2666, W2667, W2668, W2669, W2670, W2671, W2672, W2673, W2674, W2675, W2676, W2677, W2678, W2679, W2680, W2681, W2682, W2683, W2684, W2685, W2686, W2687, W2688, W2689, W2690, W2691, W2692, W2693, W2694, W2695, W2696, W2697, W2698, W2699, W2700, W2701, W2702, W2703, W2704, W2705, W2706, W2707, W2708, W2709, W2710, W2711, W2712, W2713, W2714, W2715, W2716, W2717, W2718, W2719, W2720, W2721, W2722, W2723, W2724, W2725, W2726, W2727, W2728, W2729, W2730, W2731, W2732, W2733, W2734, W2735, W2736, W2737, W2738, W2739, W2740, W2741, W2742, W2743, W2744, W2745, W2746, W2747, W2748, W2749, W2750, W2751, W2752, W2753, W2754, W2755, W2756, W2757, W2758, W2759, W2760, W2761, W2762, W2763, W2764, W2765, W2766, W2767, W2768, W2769, W2770, W2771, W2772, W2773, W2774, W2775, W2776, W2777, W2778, W2779, W2780, W2781, W2782, W2783, W2784, W2785, W2786, W2787, W2788, W2789, W2790, W2791, W2792, W2793, W2794, W2795, W2796, W2797, W2798, W2799, W2800, W2801, W2802, W2803, W2804, W2805, W2806, W2807, W2808, W2809, W2810, W2811, W2812, W2813, W2814, W2815, W2816, W2817, W2818, W2819, W2820, W2821, W2822, W2823, W2824, W2825, W2826, W2827, W2828, W2829, W2830, W2831, W2832, W2833, W2834, W2835, W2836, W2837, W2838, W2839, W2840, W2841, W2842, W2843, W2844, W2845, W2846, W2847, W2848, W2849, W2850, W2851, W2852, W2853, W2854, W2855, W2856, W2857, W2858, W2859, W2860, W2861, W2862, W2863, W2864, W2865, W2866, W2867, W2868, W2869, W2870, W2871, W2872, W2873, W2874, W2875, W2876, W2877, W2878, W2879, W2880, W2881, W2882, W2883, W2884, W2885, W2886, W2887, W2888, W2889, W2890, W2891, W2892, W2893, W2894, W2895, W2896, W2897, W2898, W2899, W2900, W2901, W2902, W2903, W2904, W2905, W2906, W2907, W2908, W2909, W2910, W2911, W2912, W2913, W2914, W2915, W2916, W2917, W2918, W2919, W2920, W2921, W2922, W2923, W2924, W2925, W2926, W2927, W2928, W2929, W2930, W2931, W2932, W2933, W2934, W2935, W2936, W2937, W2938, W2939, W2940, W2941, W2942, W2943, W2944, W2945, W2946, W2947, W2948, W2949, W2950, W2951, W2952, W2953, W2954, W2955, W2956, W2957, W2958, W2959, W2960, W2961, W2962, W2963, W2964, W2965, W2966, W2967, W2968, W2969, W2970, W2971, W2972, W2973, W2974, W2975, W2976, W2977, W2978, W2979, W2980, W2981, W2982, W2983, W2984, W2985, W2986, W2987, W2988, W2989, W2990, W2991, W2992, W2993, W2994, W2995, W2996, W2997, W2998, W2999, W3000, W3001, W3002, W3003, W3004, W3005, W3006, W3007, W3008, W3009, W3010, W3011, W3012, W3013, W3014, W3015, W3016, W3017, W3018, W3019, W3020, W3021, W3022, W3023, W3024, W3025, W3026, W3027, W3028, W3029, W3030, W3031, W3032, W3033, W3034, W3035, W3036, W3037, W3038, W3039, W3040, W3041, W3042, W3043, W3044, W3045, W3046, W3047, W3048, W3049, W3050, W3051, W3052, W3053, W3054, W3055, W3056, W3057, W3058, W3059, W3060, W3061, W3062, W3063, W3064, W3065, W3066, W3067, W3068, W3069, W3070, W3071, W3072, W3073, W3074, W3075, W3076, W3077, W3078, W3079, W3080, W3081, W3082, W3083, W3084, W3085, W3086, W3087, W3088, W3089, W3090, W3091, W3092, W3093, W3094, W3095, W3096, W3097, W3098, W3099, W3100, W3101, W3102, W3103, W3104, W3105, W3106, W3107, W3108, W3109, W3110, W3111, W3112, W3113, W3114, W3115, W3116, W3117, W3118, W3119, W3120, W3121, W3122, W3123, W3124, W3125, W3126, W3127, W3128, W3129, W3130, W3131, W3132, W3133, W3134, W3135, W3136, W3137,

A map of the United States with an inset showing the state of California. A scale bar at the top indicates distances in Nautical Miles (0, 50, 100) and Miles (0, 50, 100). A north arrow is located in the top right corner.

Appendix A: Inventory of Ranges and Range Complexes, Special Use Airspace, and Military Training Routes

Figure A-7 DoD Regional Range Complexes: Alaska

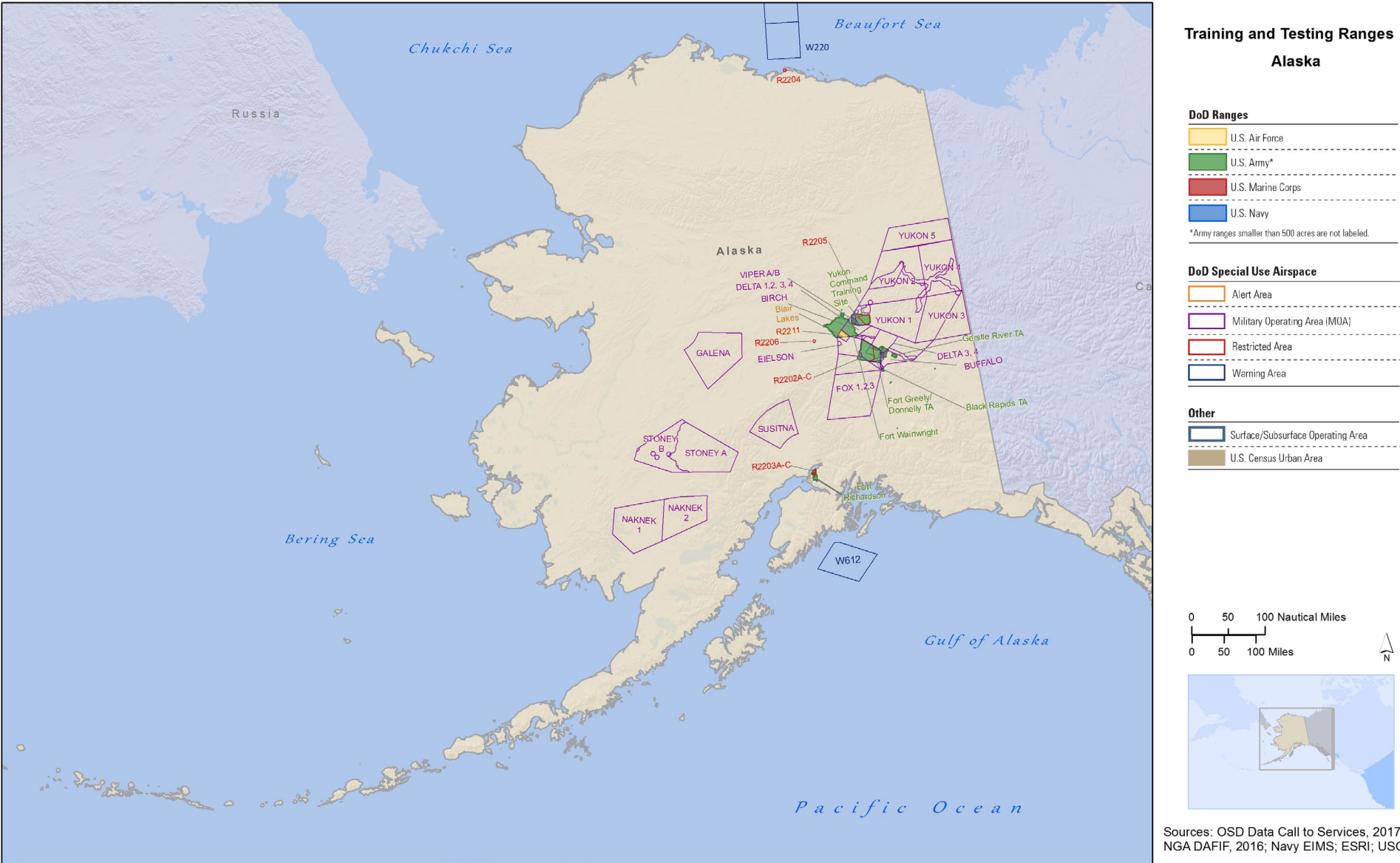


Figure A-8 DoD Regional Range Complexes: Hawaii

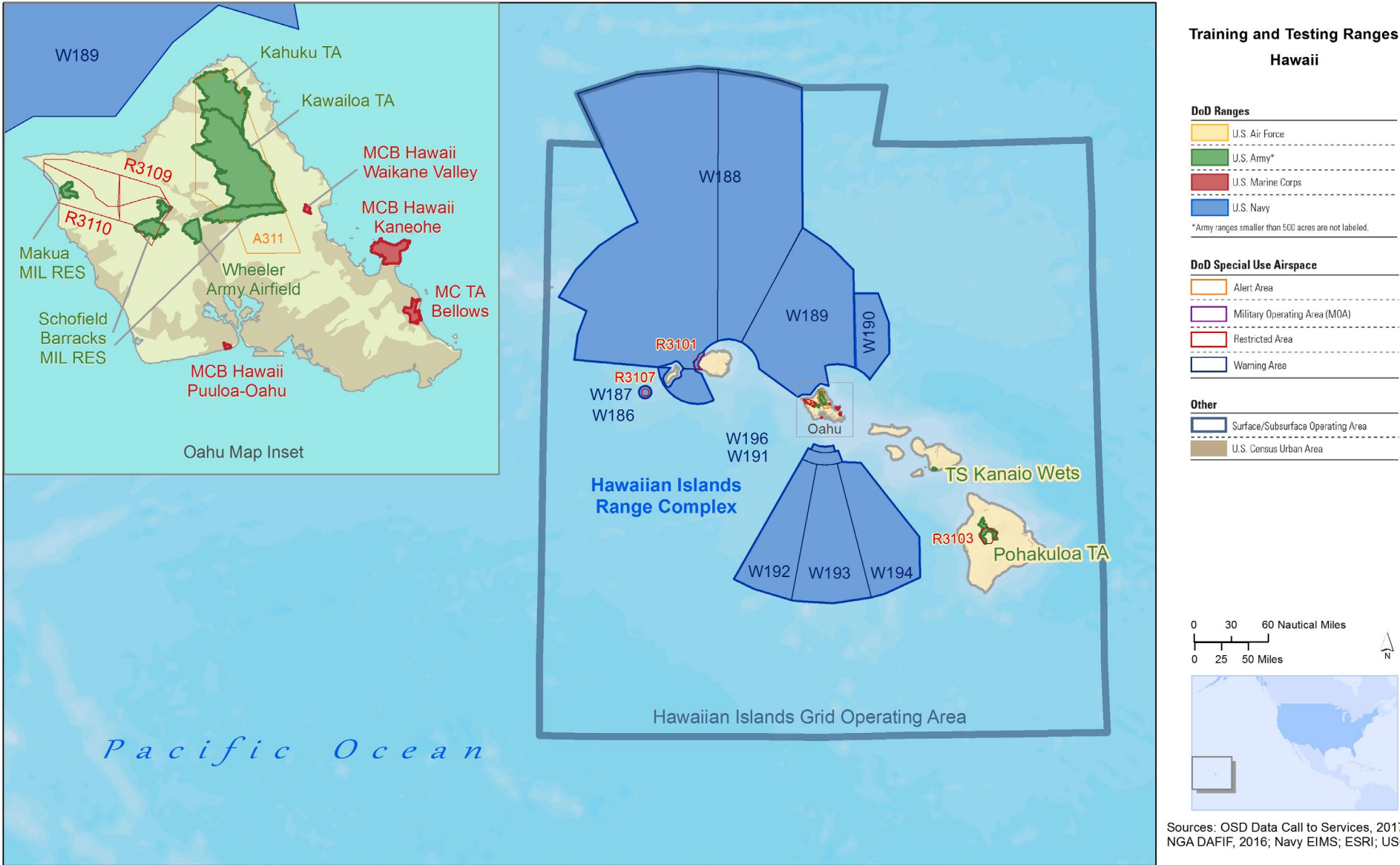


Figure A-9 DoD Regional Range Complexes: Europe



Figure A-10 DoD Regional Range Complexes: Asia

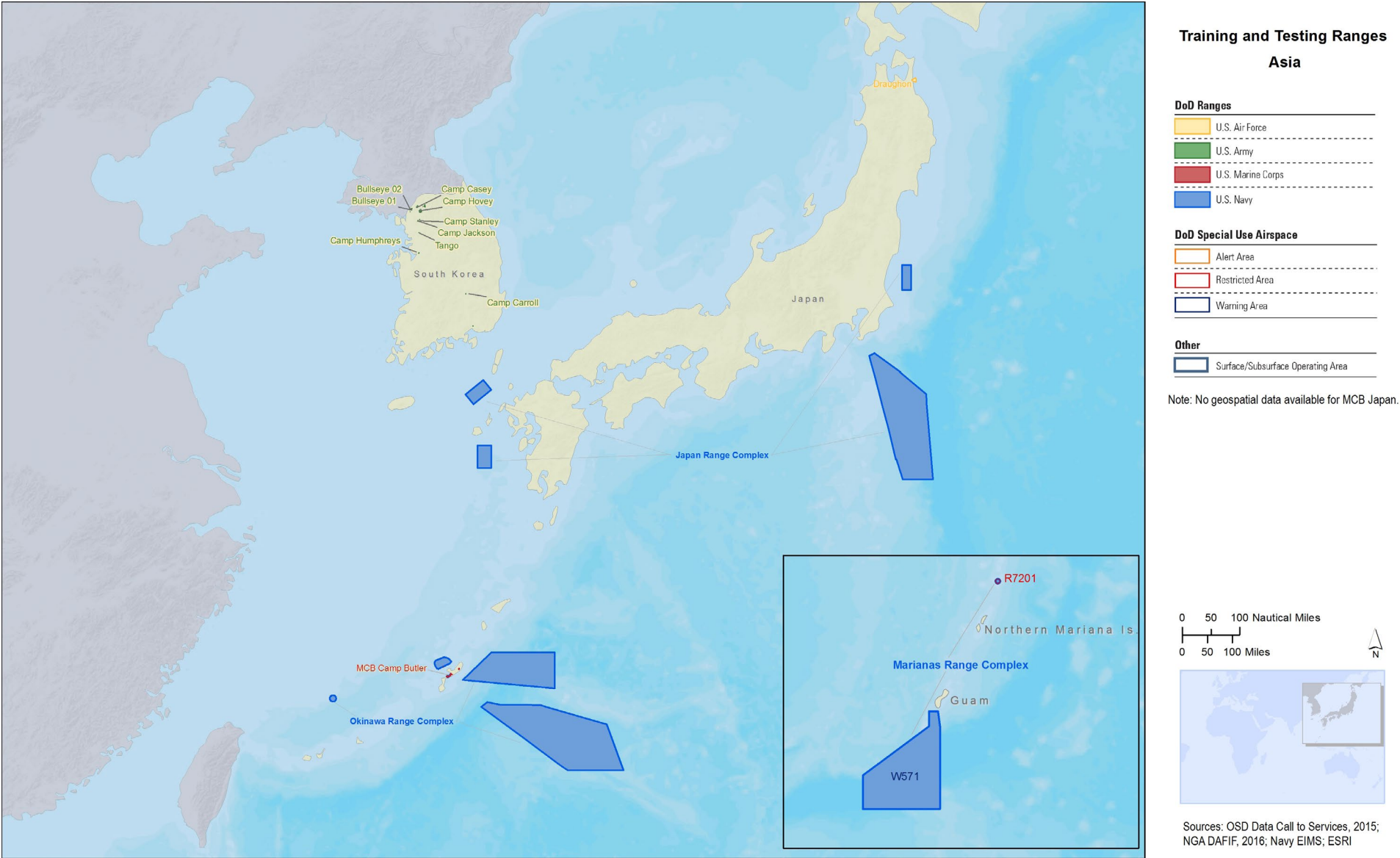


Table A-1 Training Range Complex Inventory

Military Service	Range Complex	United States (US) or Overseas (OS)	State or Country	Command/Component	Range Description				Range Type										
					Land Area for Ranges (acres)	Special Use Airspace (sq nm)	Sea Surface Area (sq nm)	Underwater Tracking Area (sq nm)	Air-to-Air or Air-to-Surface	Air-to-Ground	Land Maneuver	Land Impact Area	Land Firing Range	C2W/EW	Ocean Operating Area	MOUT	Instrumented Underwater Tracking Range	Amphibious Area	Other
Army	Aberdeen Proving Ground	US	MD	IMCOM	65,090	133	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Albuquerque #2 Wet Site	US	NM	USARC	7	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Anniston Army Depot	US	AL	AMC	105	0	0	0	N	N	N	N	Y	N	N	N	N	N	Y
	Arden Hills Army Training Site	US	MN	ARNG	1,476	0	0	0	N	N	Y	N	N	N	N	N	N	N	Y
	Auburn Training Site	US	ME	ARNG	134	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Bangor Training Site	US	ME	ARNG	142	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Barker Dam LTA	US	TX	USARC	1,666	0	0	0	N	N	N	N	N	N	N	N	N	N	Y
	Belton USARC	US	MO	USARC	177	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Bethany Beach Training Site	US	DE	ARNG	2	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	BG Thomas Baker Training Site	US	MD	ARNG	878	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Biak Training Areas East	US	OR	ARNG	15,291	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Biak Training Center Coutes	US	OR	ARNG	28,598	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Black Mountain Firing Range	US	NM	ARNG	2,114	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	Black Rapids Training Site	US	AK	USARPAC	2,779	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Blossom Point Research Facility	US	MD	IMCOM	1,570	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Blue Grass Army Depot	US	KY	AMC	14	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Boeblingen Range	OS	Germany	USARER	1,410	0	0	0	N	N	Y	N	Y	N	N	Y	N	N	Y
	Boeblingen Tng Area	OS	Germany	USAREUR	6	0	0	0	N	N	Y	N	Y	N	N	Y	N	N	Y
	Bog Brook Training Site	US	ME	ARNG	799	0	0	0	N	N	Y	N	Y	N	N	Y	N	N	Y
	Breitenwald Tng Area	OS	Germany	USAREUR	188	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Buckeye Training Site	US	AZ	ARNG	1,476	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Bullseye 01	OS	Korea	IMCOM	920	0	0	0	N	N	N	Y	Y	N	N	N	N	N	Y
	Bullseye 02	OS	Korea	IMCOM	265	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Camel Tracks Training Site	US	NM	ARNG	8,348	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Camp Adair Corvallis	US	OR	ARNG	522	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Camp Ashland	US	NE	ARNG	668	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Camp Ashland Fms 05	US	NE	ARNG	1	0	0	0	N	N	N	N	Y	N	N	N	N	N	Y
	Camp Atterbury	US	IN	ARNG	34,719	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Camp Beauregard	US	LA	ARNG	12,649	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y

Table A-1 Training Range Complex Inventory, continued

Military Service	Range Complex	United States (US) or Overseas (OS)	State or Country	Command/Component	Range Description				Range Type										
					Land Area for Ranges (acres)	Special Use Airspace (sq nm)	Sea Surface Area (sq nm)	Underwater Tracking Area (sq nm)	Air-to-Air or Air-to-Surface	Air-to-Ground	Land Maneuver	Land Impact Area	Land Firing Range	C2W/EW	Ocean Operating Area	MOUT	Instrumented Underwater Tracking Range	Amphibious Area	Other
Army	Camp Bowie - Musgrave (Fed)	US	TX	ARNG	8,861	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Camp Bowie (State)	US	TX	ARNG	70	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Camp Carroll	OS	Korea	IMCOM	15	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Camp Casey	OS	Korea	IMCOM	2,460	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Camp Casey, Yong Pyong	OS	Korea	IMCOM	1,938	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Camp Dodge Johnston Training Site	US	IA	ARNG	3,720	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Camp Ederle	OS	Italy	USAREUR	1	0	0	0	N	N	N	N	Y	N	N	Y	N	N	Y
	Camp Fogarty Training Site	US	RI	ARNG	10,505	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Camp Frank D. Merrill	US	GA	IMCOM	338,995	0	0	0	N	N	N	N	Y	N	N	N	N	N	Y
	Camp Grafton	US	ND	ARNG	9,931	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Camp Gruber Training Center	US	OK	ARNG	48,441	0	0	0	N	N	Y	N	Y	N	N	Y	N	Y	Y
	Camp Henry, Masan Ammunition Depot	OS	Korea	IMCOM	10	0	0	0	N	N	N	N	Y	N	N	N	N	N	Y
	Camp Hovey	OS	Korea	IMCOM	800	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Camp Humphreys	OS	Korea	IMCOM	2	0	0	0	N	N	N	N	Y	N	N	N	N	N	Y
	Camp Jackson	OS	Korea	IMCOM	182	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Camp Joseph T Robinson	US	AR	ARNG	30,870	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Camp Keyes Training Site	US	ME	ARNG	1	0	0	0	N	N	N	N	N	N	N	N	N	N	Y
	Camp Mabry	US	TX	ARNG	204	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Camp Mackall	US	NC	IMCOM	60,765	0	0	0	N	N	Y	N	N	N	N	N	N	N	Y
	Camp Maxey	US	TX	ARNG	6,546	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Camp Minden Training Site	US	LA	ARNG	14,762	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	Camp Murray	US	WA	ARNG	98	0	0	0	N	N	N	N	N	N	N	N	N	N	Y
	Camp Navajo	US	AZ	ARNG	26,231	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Camp Niantic	US	CT	ARNG	16	0	0	0	N	N	N	N	N	N	N	N	N	N	Y
	Camp Pendleton Smr	US	VA	ARNG	118	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Camp Perry Joint Training Center	US	OH	ARNG	7,118	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Camp Ravenna Joint Military Training Center	US	OH	ARNG	20,813	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Camp Ripley	US	MN	ARNG	54,154	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Camp Santiago Training Center	OS	PR	ARNG	12,368	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y

Table A-1 Training Range Complex Inventory, continued

Military Service	Range Complex	United States (US) or Overseas (OS)	State or Country	Command/Component	Range Description				Range Type										
					Land Area for Ranges (acres)	Special Use Airspace (sq nm)	Sea Surface Area (sq nm)	Underwater Tracking Area (sq nm)	Air-to-Air or Air-to-Surface	Air-to-Ground	Land Maneuver	Land Impact Area	Land Firing Range	C2W/EW	Ocean Operating Area	MOUT	Instrumented Underwater Tracking Range	Amphibious Area	Other
Army	Camp Sherman Joint Training Center	US	OH	ARNG	420	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	N
	Camp Smith / Csms A	US	NY	ARNG	1,471	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Camp Stanley	OS	Korea	IMCOM	29	0	0	0	N	N	Y	Y	N	N	N	N	N	N	Y
	Camp Swift	US	TX	ARNG	11,716	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Camp Villere	US	LA	ARNG	1,456	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Cao Malnisio	OS	Italy	USAREUR	4,099	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Caswell Training Site	US	ME	ARNG	1,065	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	N
	Cellina-Meduna	OS	Italy	USAREUR	15,859	81	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Chievres Airbase	OS	Belgium	USAREUR	60	0	0	0	N	N	N	N	Y	N	N	N	N	N	Y
	County Line Range Racine	US	WI	ARNG	25	0	0	0	N	N	N	N	Y	N	N	N	N	N	N
	Camp McCain	US	MS	ARNG	12,703	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Camp Dawson-Kingwood	US	WV	ARNG	10,074	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Camp San Luis Obispo	US	CA	ARNG	5,032	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Fort Custer Training Center	US	MI	ARNG	7,404	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Darmstadt Training Center	OS	Germany	USAREUR	107	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Deepwoods Training Site	US	ME	ARNG	128,016	0	0	0	N	N	N	N	N	N	N	N	N	N	Y
	Deseret Chemical Depot	US	UT	AMC	552	0	0	0	N	N	N	N	N	Y	N	N	N	N	Y
	Devens Reserve Forces Training Area	US	MA	USARC	4,876	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Dillingham Mil Res	US	HI	IMCOM	449	0	0	0	N	N	Y	N	N	N	N	N	N	N	Y
	Disney Training Center	US	KY	ARNG	499	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	Dix	US	NJ	USARC	28,994	104	0	0	N	N	N	Y	Y	N	N	N	N	N	Y
	Fort Greely/Donnelly Training Area	US	AK	IMCOM	635,889	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Dugway Proving Ground	US	UT	IMCOM	260,214	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Eagle Mountain Lake	US	TX	ARNG	1,246	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	East Haven Rifle Range	US	CT	ARNG	5	0	0	0	N	N	Y	Y	N	N	N	N	N	N	Y
	Edgemeade Ts Mtn Home	US	ID	ARNG	132	0	0	0	N	Y	N	N	N	N	N	N	N	N	N
	Eglin AFB Ft Walton Beach	US	FL	ARNG	33,196	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	Eklutna Glacier Training Site	US	AK	USARPAC	33	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Finthen Local Training Area	OS	Germany	USAREUR	112	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y

Table A-1 Training Range Complex Inventory, continued

Military Service	Range Complex	United States (US) or Overseas (OS)	State or Country	Command/Component	Range Description				Range Type										
					Land Area for Ranges (acres)	Special Use Airspace (sq nm)	Sea Surface Area (sq nm)	Underwater Tracking Area (sq nm)	Air-to-Air or Air-to-Surface	Air-to-Ground	Land Maneuver	Land Impact Area	Land Firing Range	C2W/EW	Ocean Operating Area	MOUT	Instrumented Underwater Tracking Range	Amphibious Area	Other
Army	Florence Military Reservation	US	AZ	ARNG	7,618	61	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Florence Military Reservation East	US	AZ	ARNG	11,096	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Florence Military Reservation West	US	AZ	ARNG	141	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Foce Del Reno	OS	Italy	USAREUR	8,941	0	0	0	N	N	N	Y	Y	N	N	N	N	N	Y
	Foce Fume Serchio	OS	Italy	USAREUR	4	0	0	0	N	N	N	Y	Y	N	N	N	N	N	N
	Fontaniva	OS	Italy	USAREUR	155	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Fort A.P. Hill	US	VA	IMCOM	72,931	928	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Fort Belvoir	US	VA	IMCOM	1,567	0	0	0	N	N	Y	Y	N	N	N	N	N	N	Y
	Fort Benning	US	GA	IMCOM	165,910	422	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Bliss	US	TX	IMCOM	85,140	4,542	0	0	N	N	Y	N	Y	N	N	Y	N	N	Y
	Fort Bliss Aaa Ranges	US	TX	IMCOM	1,043,908	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Bragg	US	NC	IMCOM	136,153	1,718	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Campbell	US	KY	IMCOM	100,848	931	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Carson	US	CO	IMCOM	125,583	1,153	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Chaffee	US	AR	ARNG	64,241	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Fort Drum	US	NY	IMCOM	98,234	299	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Eustis	US	VA	TRADOC	5,060	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Fort George G Meade	US	MD	IMCOM	6,265	0	0	0	N	N	Y	N	N	N	N	N	N	N	Y
	Fort Gordon	US	GA	IMCOM	50,975	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Hood	US	TX	IMCOM	197,761	500	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Huachuca	US	AZ	IMCOM	73,423	815	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Huachuca Gila Bend Area	US	AZ	IMCOM	714	0	0	0	N	N	N	N	N	N	N	N	N	N	Y
	Fort Hunter Liggett	US	CA	USARC	160,683	113	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Fort Indiantown Gap	US	PA	ARNG	13,681	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Jackson	US	SC	IMCOM	31,578	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Knox	US	KY	IMCOM	99,119	113	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Leavenworth	US	KS	IMCOM	3,415	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Fort Lee	US	VA	IMCOM	2,275	69	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Fort Leonard Wood	US	MO	IMCOM	55,532	175	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y

Table A-1 Training Range Complex Inventory, continued

Military Service	Range Complex	United States (US) or Overseas (OS)	State or Country	Command/Component	Range Description				Range Type										
					Land Area for Ranges (acres)	Special Use Airspace (sq nm)	Sea Surface Area (sq nm)	Underwater Tracking Area (sq nm)	Air-to-Air or Air-to-Surface	Air-to-Ground	Land Maneuver	Land Impact Area	Land Firing Range	C2W/EW	Ocean Operating Area	MOUT	Instrumented Underwater Tracking Range	Amphibious Area	Other
Army	Fort Lewis	US	WA	IMCOM	77,864	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort McCoy	US	WI	USARC	125,533	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Fort Pickett	US	VA	ARNG	38,836	161	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Polk	US	LA	IMCOM	225,569	5,471	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Richardson	US	AK	USARPAC	54,491	163	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Fort Riley	US	KS	IMCOM	91,849	107	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Rucker	US	AL	IMCOM	54,581	5,914	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Fort Sill	US	OK	IMCOM	86,356	153	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Stewart	US	GA	IMCOM	271,240	556	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Fort Wainwright	US	AK	IMCOM	656,983	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Fort Wolters	US	TX	ARNG	4,045	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Frank M. Browning USAR Center	US	UT	USARC	108	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Freihoelser Training Area	OS	Germany	USAREUR	348	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Gardiner Training Site	US	ME	ARNG	113	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Gerstle River Arctic Test Site	US	AK	IMCOM	20,792	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Grafenwoehr Training Area	OS	Germany	USAREUR	48,673	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Greenlief Training Site	US	NE	ARNG	3,161	0	0	0	N	N	Y	N	Y	N	N	Y	N	N	Y
	Guilderland Training Site	US	NY	ARNG	167	0	0	0	N	N	N	N	Y	N	N	N	N	N	Y
	Hawthorne Army Depot	US	NV	AMC	35,771	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	N
	Hayden - LTA	US	ID	USARC	678	0	0	0	N	N	N	N	Y	N	N	N	N	N	N
	Snake Creek Training Site	US	FL	ARNG	312	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Hohenfels Training Area	OS	Germany	USAREUR	38,618	0	0	0	N	N	Y	N	Y	N	N	Y	N	N	Y
	Hollis Plains Training Site	US	ME	ARNG	408	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Hunter Army Airfield	US	GA	IMCOM	3,216	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Idaho Falls TS	US	ID	ARNG	1,099	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	Iowa AAP	US	IA	AMC	1,347	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	JBSA-Bullis	US	TX	MEDCOM	27,300	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Johnson City Usarc	US	TN	USARC	195	0	0	0	N	N	Y	N	N	N	N	N	N	N	N

Table A-1 Training Range Complex Inventory, continued

Military Service	Range Complex	United States (US) or Overseas (OS)	State or Country	Command/Component	Range Description				Range Type										
					Land Area for Ranges (acres)	Special Use Airspace (sq nm)	Sea Surface Area (sq nm)	Underwater Tracking Area (sq nm)	Air-to-Air or Air-to-Surface	Air-to-Ground	Land Maneuver	Land Impact Area	Land Firing Range	C2W/EW	Ocean Operating Area	MOUT	Instrumented Underwater Tracking Range	Amphibious Area	Other
Army	Joliet USARC/JTA	US	IL	USARC	3,548	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Kahuku Training Area	US	HI	IMCOM	9,456	0	0	0	N	N	Y	N	N	N	N	N	N	N	Y
	Kanaio Training Area (TS Kanaio Wets)	US	HI	ARNG	4,622	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	Kawailoa Training Area	US	HI	IMCOM	23,178	0	0	0	N	N	Y	N	N	N	N	N	N	N	Y
	Lake City AAP	US	MO	AMC	696	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Laporte Co Veterans Usarc	US	CO	USARC	938	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Letterkenny Army Depot	US	PA	AMC	11	0	0	0	N	N	N	N	Y	N	N	N	N	N	N
	Limestone Hills (MTA)	US	MT	ARNG	20,321	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Livorno Training Area	OS	Italy	USAREUR	86	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Los Alamitos JFTB	US	CA	ARNG	257	0	0	0	N	N	N	N	Y	N	N	N	N	N	Y
	LTA Marion Engr Depot East	US	OH	USARC	128	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Macon TS	US	MO	ARNG	3,093	0	0	0	N	N	Y	N	Y	N	N	Y	N	N	Y
	Mainz	OS	Germany	USAREUR	115	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Makua Mil Reserve	US	HI	IMCOM	4,246	21	0	0	N	N	N	Y	Y	N	N	N	N	N	Y
	Marseilles (MTA Training Area)	US	IL	ARNG	2,742	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	McAlester AAP	US	OK	AMC	10,897	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Mead LTA	US	NE	USARC	965	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Mead Ts/Fms 06/Utes 02	US	NE	ARNG	1,171	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Military Ocean Tml Sunny Point	US	NC	AMC	9	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	Monte Carpegna	OS	Italy	USAREUR	6,491	0	0	0	N	N	Y	Y	N	N	N	N	N	N	N
	Monte Romano	OS	Italy	USAREUR	10,018	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Mout Training Site - Fort McClellan	US	AL	ARNG	1	0	0	0	N	N	N	N	Y	N	N	Y	N	N	N
	MTA Camp Butner	US	NC	ARNG	4,387	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	MTA Camp Clark Nevada	US	NV	ARNG	1,072	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	MTA Camp Crowder	US	MO	ARNG	4,173	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	MTA Camp Curtis Guild	US	MA	ARNG	639	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	MTA Camp Edwards	US	MA	ARNG	13,639	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	MTA Camp Fretterd	US	MD	ARNG	399	0	0	0	N	N	Y	N	N	N	N	N	N	N	Y
	MTA Camp Rilea	US	OR	ARNG	1,649	0	0	0	N	N	Y	Y	Y	N	Y	N	N	Y	Y

Table A-1 Training Range Complex Inventory, continued

Military Service	Range Complex	United States (US) or Overseas (OS)	State or Country	Command/Component	Range Description				Range Type										
					Land Area for Ranges (acres)	Special Use Airspace (sq nm)	Sea Surface Area (sq nm)	Underwater Tracking Area (sq nm)	Air-to-Air or Air-to-Surface	Air-to-Ground	Land Maneuver	Land Impact Area	Land Firing Range	C2W/EW	Ocean Operating Area	MOUT	Instrumented Underwater Tracking Range	Amphibious Area	Other
Army	MTA Camp Shelby	US	MS	ARNG	133,308	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	MTA Clarks Hill Reservation	US	SC	ARNG	921	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	MTA Ft William Henry Harrison	US	MT	ARNG	6,535	1,955	0	0	N	N	Y	N	Y	N	N	Y	N	N	Y
	MTA Gunpowder Military Reservation	US	MD	ARNG	241	0	0	0	N	N	Y	N	N	N	N	N	N	N	Y
	MTA Lauderick Creek Training Area	US	MD	ARNG	1,105	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	MTA McCrady Training Site	US	SC	ARNG	20,347	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	MTA-L Camp Williams-West Fed	US	UT	ARNG	23,364	156	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	MTC Camp Blanding	US	FL	ARNG	66,246	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	MTC-H Camp Grayling	US	MI	ARNG	139,288	8,680	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	MTC Camp Guernsey	US	WY	ARNG	80,063	46	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	MTC Camp Roberts	US	CA	ARNG	40,981	64	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Muscatatuck Urban Training Center	US	IN	ARNG	961	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	NG Youngstown Training Site	US	NY	ARNG	853	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	NTC/Fort Irwin	US	CA	IMCOM	635,371	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Oberdachstetten Tng Area	OS	Germany	USAREUR	907	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Orchard Training Area	US	ID	ARNG	143,308	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Panzer Kaserne Ge643	OS	Germany	USAREUR	1	0	0	0	N	N	N	N	Y	N	N	N	N	N	Y
	Papago Military Reservation	US	AZ	ARNG	129	0	0	0	N	N	N	N	Y	N	N	N	N	N	Y
	Parks Reserve Forces Training Area	US	CA	USARC	1,950	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Pelham Range Training Site - Fort McClellan	US	AL	ARNG	22,199	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Picacho Aviation Training Site	US	AZ	ARNG	99	0	0	0	N	N	N	N	N	N	N	N	N	N	Y
	Picatinny Arsenal	US	NJ	IMCOM	4,420	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Pierre Training Site	US	SD	ARNG	5	0	0	0	N	N	N	N	Y	N	N	N	N	N	N
	Pine Bluff Arsenal	US	AR	AMC	101	0	0	0	N	N	N	Y	Y	N	N	N	N	N	Y
	Pinon Canyon	US	CO	IMCOM	224,432	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Platte Armory	US	SD	ARNG	41	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Plymouth Training Site	US	ME	ARNG	324	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Pocatello Airport LTA	US	ID	USARC	14	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Pohakuloa Training Area	US	HI	IMCOM	130,813	152	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y

Table A-1 Training Range Complex Inventory, continued

Military Service	Range Complex	United States (US) or Overseas (OS)	State or Country	Command/Component	Range Description				Range Type										
					Land Area for Ranges (acres)	Special Use Airspace (sq nm)	Sea Surface Area (sq nm)	Underwater Tracking Area (sq nm)	Air-to-Air or Air-to-Surface	Air-to-Ground	Land Maneuver	Land Impact Area	Land Firing Range	C2W/EW	Ocean Operating Area	MOUT	Instrumented Underwater Tracking Range	Amphibious Area	Other
Army	P-Series	OS	Italy	USAREUR	5,584	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Pyongtaek Cpx Area	OS	Korea	IMCOM	48	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Ramey USARC/Aquadilla	OS	PR	USARC	53	0	0	0	N	N	N	N	N	N	N	N	N	N	Y
	Red River Army Depot	US	TX	AMC	31	0	0	0	N	N	N	N	Y	N	N	N	N	N	Y
	Redstone Arsenal	US	AL	IMCOM	20,870	25	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	Renato Del Din	OS	Italy	USAREUR	1	0	0	0	N	N	N	N	Y	N	N	N	N	N	Y
	Rittenhouse Training Site	US	AZ	ARNG	720	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	River Road Training Site	US	DE	ARNG	82	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	Rivoli Bianchi	OS	Italy	USAREUR	235	0	0	0	N	N	N	N	Y	N	N	N	N	N	N
	Roswell Wets	US	NM	ARNG	3,837	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	Salina Smoky Hill Ang Range	US	KS	ARNG	3,694	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	San Giorgio	OS	Italy	USAREUR	26	0	0	0	N	N	N	N	N	N	N	Y	N	N	N
	Santa Fe - Onate Complex Training Site	US	NM	ARNG	72	0	0	0	N	N	Y	N	Y	N	N	Y	N	N	Y
	Santa Severa	OS	Italy	USAREUR	1,867	0	0	0	N	N	N	Y	Y	N	N	N	N	N	N
	Schofield Barracks Military Reservation	US	HI	IMCOM	8,531	15	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Scranton Leach Range	US	PA	ARNG	76	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	Sea Girt NJ NGTC	US	NJ	ARNG	120	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Seagoville USARC	US	TX	USARC	202	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Sierra Army Depot	US	CA	AMC	4,807	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Silver Creek	US	NE	ARNG	351	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Sioux Falls Foss Field Complex	US	SD	ARNG	1	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	Smith Barracks	OS	Germany	USAREUR	1,989	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Snake Creek Training Site	US	FL	ARNG	312	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Snow Camp Training Site	US	NC	ARNG	100	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Sparta Armory	US	IL	ARNG	2,620	0	0	0	N	N	N	N	N	N	N	N	N	N	Y
	Stead Training Area - Swan Lake	US	NV	ARNG	199	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	Stones Ranch Military Reservation	US	CT	ARNG	1,884	0	0	0	N	N	Y	N	Y	N	N	Y	N	N	Y
	Sunflower Wet Site	US	KS	USARC	85	0	0	0	N	N	Y	N	N	N	N	N	N	N	Y
	Tango	OS	Korea	IMCOM	147	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y

Table A-1 Training Range Complex Inventory, continued

Military Service	Range Complex	United States (US) or Overseas (OS)	State or Country	Command/Component	Range Description				Range Type										
					Land Area for Ranges (acres)	Special Use Airspace (sq nm)	Sea Surface Area (sq nm)	Underwater Tracking Area (sq nm)	Air-to-Air or Air-to-Surface	Air-to-Ground	Land Maneuver	Land Impact Area	Land Firing Range	C2W/EW	Ocean Operating Area	MOUT	Instrumented Underwater Tracking Range	Amphibious Area	Other
Army	Tarleton Training Site	US	OH	ARNG	100	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Te O USARC	OS	AS	USARC	79	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Toledo Area USAR	US	OH	USARC	29	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Tooele Army Depot	US	UT	AMC	2,009	0	0	0	N	N	N	N	Y	N	N	N	N	N	N
	Training Site NH NG	US	NH	ARNG	105	0	0	0	N	N	Y	N	Y	N	N	Y	N	N	Y
	T-Series	OS	Italy	USAREUR	10,698	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	TS Camp Johnson	US	VT	ARNG	642	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	TS Camp Varnum	US	RI	ARNG	18	0	0	0	N	N	Y	N	N	N	N	N	N	N	Y
	TS Clark Natl Forest Wapp	US	MS	ARNG	2,006	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	TS Ethan Allen Range	US	VT	ARNG	10,397	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	TS Ike Skelton Jefferson City	US	MS	ARNG	131	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	TS Keaukaha Military Reservation	US	HI	ARNG	435	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	N
	TS Kekaha Wets LTA	US	HI	ARNG	62	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	TS NAS Fallon Range B19	US	NV	ARNG	51	0	0	0	N	N	N	N	Y	N	N	N	N	N	Y
	TS NG Lander	US	WY	ARNG	1,398	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	TS NG Lovell	US	WY	ARNG	3,604	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	TS NG Sheridan	US	WY	ARNG	3,986	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	TS Range Fowler	US	IN	ARNG	43	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	TS Ukumehame Range	US	HI	ARNG	41	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	TS Waco LTA	US	MT	ARNG	7,960	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	Umatilla Chemical Depot	US	WA	IMCOM	28	0	0	0	N	N	N	N	Y	N	N	N	N	N	Y
	USAR Keystone Ord Outdoor Training	US	PA	USARC	490	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	Vicenza	OS	Italy	USAREUR	1	0	0	0	N	N	N	Y	N	N	N	Y	N	N	Y
	Volkstone	US	WV	ARNG	320	0	0	0	N	N	N	N	N	N	N	N	N	N	Y
	VTS Catoosa	US	GA	ARNG	1,572	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	VTS John Sevier	US	TN	ARNG	5	0	0	0	N	N	N	N	Y	N	N	N	N	N	N
	VTS Milan	US	TN	ARNG	2,388	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	VTS Smyrna	US	TN	ARNG	520	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	VTS Tullahoma	US	TN	ARNG	7,931	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y

Table A-1 Training Range Complex Inventory, continued

Military Service	Range Complex	United States (US) or Overseas (OS)	State or Country	Command/Component	Range Description				Range Type										
					Land Area for Ranges (acres)	Special Use Airspace (sq nm)	Sea Surface Area (sq nm)	Underwater Tracking Area (sq nm)	Air-to-Air or Air-to-Surface	Air-to-Ground	Land Maneuver	Land Impact Area	Land Firing Range	C2W/EW	Ocean Operating Area	MOUT	Instrumented Underwater Tracking Range	Amphibious Area	Other
Army	W. Silver Spring Complex	US	WI	USARC	5	0	0	0	N	N	N	N	N	N	N	N	N	N	Y
	W.H. Ford Regional Training Center	US	KY	ARNG	10,770	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y
	Wackernheim Regional Range Complex	OS	Germany	USAREUR	14	0	0	0	N	N	N	N	Y	N	N	N	N	N	Y
	Watertown TS Range	US	SD	ARNG	1	0	0	0	N	N	N	N	Y	N	N	N	N	N	N
	Watervliet Arsenal	US	NY	AMC	2	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	Weldon Spring Training Area	US	MO	USARC	1,631	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	West Camp Rapid	US	SD	ARNG	764	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	West Point Military Reservation	US	NY	IMCOM	12,708	5	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Wheeler Army Airfield	US	HI	IMCOM	115	21	0	0	N	N	N	N	N	N	N	N	N	N	Y
	Whistler Creek Training Site	US	AK	USARPAC	542	0	0	0	N	N	Y	N	N	N	N	N	N	N	N
	White Sands Missile Range	US	NM	IMCOM	2,187,596	9,159	0	0	N	N	N	Y	Y	N	N	N	N	N	Y
	Yakima Training Center	US	WA	IMCOM	323,805	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Yukon Command Training Site	US	AK	IMCOM	257,623	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y
	Yuma Proving Ground	US	AZ	IMCOM	624,509	1,623	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
Marine Corps	MCLB Albany	US	GA	MCIEAST	4	0	0	0	N	N	N	N	Y	N	N	N	N	N	N
	MCLB Barstow	US	CA	MCIWEST	2,438	0	0	0	N	N	N	N	Y	N	N	N	N	N	N
	MCAS Beaufort/Townsend Bombing Range	US	GA	MCIEAST	5,183	1,130	0	0	Y	Y	N	Y	Y	N	N	N	N	N	Y
	MCMWTC Bridgeport	US	CA	TECOM	59,177	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	N
	MCAS Cherry Point	US	NC	MCIEAST	29,139	1,082	0	0	Y	Y	Y	Y	Y	Y	N	Y	N	N	N
	MCB Hawaii	US	HI	MCIPAC	1,986	0	0	0	N	N	Y	N	Y	N	N	Y	N	Y	Y
	MCIPAC - MCB Butler	OS	Japan	MCIPAC	36,013	333	0	0	N	N	Y	Y	Y	N	Y	Y	N	N	Y
	MCB Camp Lejeune	US	NC	MCIEAST	126,677	151	0	0	N	Y	Y	Y	Y	N	Y	Y	N	Y	Y
	MCAS Miramar (Camp Elliott)	US	CA	MCIWEST	14,311	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y
	MCRD Parris Island	US	SC	TECOM	1,100	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N
	MCB Camp Pendleton	US	CA	MCIWEST	125,704	180	0	0	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
	MCB Quantico	US	VA	MCINCR	54,440	184	0	0	N	Y	Y	Y	Y	N	N	Y	N	N	Y
	MCAGCC Twentynine Palms	US	CA	TECOM	761,239	1,268	0	0	N	Y	Y	Y	Y	Y	N	Y	N	N	Y
	MCAS Yuma/Bob Stump	US	AZ	MCIWEST	1,213,713	7,085	0	0	Y	Y	Y	Y	Y	Y	N	N	N	N	Y

Table A-1 Training Range Complex Inventory, continued

Military Service	Range Complex	United States (US) or Overseas (OS)	State or Country	Command/Component	Range Description				Range Type										
					Land Area for Ranges (acres)	Special Use Airspace (sq nm)	Sea Surface Area (sq nm)	Underwater Tracking Area (sq nm)	Air-to-Air or Air-to-Surface	Air-to-Ground	Land Maneuver	Land Impact Area	Land Firing Range	C2W/EW	Ocean Operating Area	MOUT	Instrumented Underwater Tracking Range	Amphibious Area	Other
Navy	Atlantic City	US	NJ	CFFC	0	5,585	4,413	4,413	Y / N	N	N	N	N	N	Y	N	N	N	N
	Atlantic Test Range (ATR) - Patuxent River *	US	MD, VA	NAVAIR	5,700	3,401	330	0	Y / Y	Y	N	Y	N	Y	N	N	N	N	N
	Atlantic Undersea Test and Evaluation Center (AUTEC) *	OS	Bahamas	NAVSEA	0	870	1,320	500	N / Y	N	N	N	N	N	Y	N	Y	N	N
	Boston	US	MA	CFFC	0	10,099	13,494	13,494	Y / N	N	N	N	N	N	Y	N	N	N	Y
	China Lake *	US	CA	NAVAIR	1,141,200	13,661	0	0	Y / Y	Y	N	Y	N	Y	N	N	N	N	N
	El Centro	US	CA	CPF	43,948	256	0	0	N / Y	Y	Y	Y	N	N	N	N	N	N	Y
	Fallon	US	NV	CFFC	232,481	14,182	0	0	N / Y	Y	Y	Y	Y	Y	N	Y	N	N	N
	Gulf of Mexico (GOMEX)	US	FL, MS, TX	CFFC	10,057	38,393	17,469	17,469	Y / Y	Y	N	Y	Y	N	Y	N	N	Y	N
	Hawaii	US	HI	CPF	303	94,083	214,638	900	Y / Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y
	Jacksonville	US	FL, GA, SC	CFFC	17,728	61,265	50,098	50,098	Y / Y	Y	N	Y	Y	N	Y	N	Y **	N	N
	Japan	OS	Japan	CPF	0	10,165	0	0	Y / Y	N	N	N	N	N	N	N	N	N	N
	Key West	US	FL	CFFC	1	24,812	8,282	8,282	Y / N	N	N	N	N	N	Y	N	N	N	Y
	Mariana Islands	US	CNMI, Guam	CPF	24,894	8,726	8,698	8,698	Y / Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y
	Narragansett	US	RI	CFFC	0	13,005	27,208	27,208	Y / N	N	N	N	N	N	Y	N	N	N	N
	Navy Cherry Point	US	NC	CFFC	0	18,718	18,718	18,718	Y / Y	N	N	N	N	Y	Y	N	N	N	Y
	Northern California (NOCAL)	US	CA	CPF	0	19,681	0	0	Y / Y	N	N	N	N	N	N	N	N	N	N
	Northwest Training Range Complex	US	CA, OR, WA	CPF	49,674	42,714	128,103	128,103	Y / Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y
	Okinawa	OS	Japan	CPF	0	35,129	0	0	Y / Y	Y	N	N	N	N	N	N	N	N	N
	Point Mugu Sea Range *	US	CA	NAVAIR	15,000	27,712	27,278	0	Y / N	Y	N	N	N	Y	Y	N	N	N	N
	Southern California (SOCAL)	US	CA	CPF	43,437	113,231	120,000	7,699	Y / Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Virginia Capes (VACAPES)	US	NC, VA	CFFC	1,543	29,925	28,916	28,916	Y / Y	Y	Y	Y	Y	Y	Y	Y	N	N	N
Air Force	Adirondack	US	NY	ANG	75,000	3,782	0	0	N	Y	N	N	N	Y	N	N	N	N	N
	Airburst	US	CO	ANG	4,257	171	0	0	N	Y	N	N	N	Y	N	N	N	N	N
	Atterbury	US	IN	ANG	18,500	177	0	0	N	Y	N	N	N	Y	N	N	N	N	N
	Avon Park	US	FL	ACC	106,073	1,599	0	0	Y	Y	Y	N	N	N	N	Y	N	N	N
	Barry M. Goldwater Range (BMGR)	US	AZ	AETC	1,607,018	5,231	0	0	Y	Y	N	N	N	Y	N	N	N	N	N
	Blair Lakes	US	AK	PACAF	30,640	28,694	0	0	N	Y	N	N	N	N	N	N	N	N	N
	Bollen	US	PA	ANG	10,657	0	0	0	N	Y	N	N	N	Y	N	N	N	N	N

Table A-1 Training Range Complex Inventory, continued

Military Service	Range Complex	United States (US) or Overseas (OS)	State or Country	Command/Component	Range Description				Range Type										
					Land Area for Ranges (acres)	Special Use Airspace (sq nm)	Sea Surface Area (sq nm)	Underwater Tracking Area (sq nm)	Air-to-Air or Air-to-Surface	Air-to-Ground	Land Maneuver	Land Impact Area	Land Firing Range	C2W/EW	Ocean Operating Area	MOUT	Instrumented Underwater Tracking Range	Amphibious Area	Other
Air Force	Cannon	US	MO	ANG	4,600	219	0	0	N	Y	N	N	N	Y	N	N	N	N	N
	Claiborne	US	LA	AFRC	7,800	2,252	0	0	N	Y	N	N	N	Y	N	N	N	N	N
	Dare County	US	NC	ACC	46,621	454	0	0	Y	Y	N	N	N	Y	N	Y	N	N	N
	Draughon	OS	Japan	PACAF	0	0	0	0	N	Y	N	N	N	Y	N	N	N	N	N
	Edwards Flight Test Range	US	CA	AFMC	50,080	13,197	0	0	Y	Y	N	N	N	Y	N	N	N	N	N
	Eglin Test and Training Complex	US	FL	AFMC	463,360	20,762	0	0	Y	Y	N	N	N	Y	N	N	N	N	N
	Falcon	US	OK	AFRC	14,900	862	0	0	N	Y	Y	N	Y	Y	N	N	N	N	N
	Grand Bay	US	GA	ACC	6,000	5,379	0	0	N	Y	N	N	N	N	N	N	N	N	N
	Grayling	US	MI	ANG	145,025	7,507	0	0	Y	Y	N	N	N	Y	N	N	N	N	N
	Hardwood	US	WI	ANG	7,263	6,181	0	0	N	Y	N	N	N	Y	N	N	N	N	N
	Holloman	US	NM	ACC	207,800	2,256	0	0	Y	Y	N	N	N	N	N	Y	N	N	N
	Jefferson	US	IN	ANG	50,000	417	0	0	Y	Y	N	N	N	Y	N	N	N	N	N
	McMullen	US	TX	ANG	2,800	0	0	0	N	Y	N	N	N	Y	N	N	N	N	N
	Melrose Air Force Range	US	NM	AFSOC	70,978	3,137	0	0	Y	Y	Y	Y	Y	Y	N	Y	N	N	N
	Mountain Home Ranges	US	ID	ACC	120,844	7,496	0	0	Y	Y	N	N	N	Y	N	Y	N	N	N
	Nevada Test and Training Range (NTTR)	US	NV	ACC	2,919,890	9,603	0	0	Y	Y	N	Y	Y	Y	N	Y	N	N	N
	Poinsett	US	SC	ACC	12,521	178	0	0	N	Y	N	N	N	Y	N	N	N	N	N
	Polygone	OS	France/ Germany	USAFE	0	0	0	0	N	N	N	N	N	Y	N	N	N	N	N
	Razorback	US	AR	ANG	5,760	1,814	0	0	N	Y	N	N	N	Y	N	N	N	N	N
	Shelby	US	MS	ANG	26,676	906	0	0	N	Y	N	N	N	Y	N	N	N	N	N
	Smoky Hill	US	KS	ANG	33,875	1,177	0	0	N	Y	N	N	N	Y	N	N	N	N	N
	Utah Test and Training Range (UTTR)	US	UT	ACC	1,712,000	12,683	0	0	Y	Y	N	N	N	Y	N	Y	N	N	N
	Warren Grove	US	NJ	ANG	9,416	146	0	0	N	Y	N	N	N	Y	N	N	N	N	N

* The Navy MRTFB ranges used by the Fleet training range community.

** The Navy's new shallow water training range is under construction.

*** The reported Special Use Airspace (SUA) associated with each AF range only represents the SUA that the AF has scheduling authority for; there may be other SUA associated with the range that the AF uses but that is scheduled by another Service.

Table A-2 Special Use Airspace Inventory

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
A211	USA, CAIRNES APP	Fort Rucker	005000AMSL	SURFACE	USA
A220	USAF, MCGUIRE AFB RAPCON	McGuire AFB	004500AMSL	SURFACE	USAF
A231	FAA, ALBUQUERQUE ARTCC	Luke AFB	006500AMSL	00500AGL	USAF
A260	USAF ACADEMY	USAF Academy	017500AMSL	SURFACE	USAF
A292	USN, COMTRAWING SIX	NAS Pensacola	003000AMSL	SURFACE	USN
A311	FAA, HONOLULU CONTROL FACILITY	Schofield, Kahuku, Kawaihoa	000500AGL	SURFACE	USA
A371	USA, CAMPBELL AAF APP	Fort Campbell	002000AMSL	SURFACE	USA
A440	USAF, 14 FTW COLUMBUS AFB	Columbus AFB	006500AMSL	SURFACE	USAF
A443	COLUMBUS APP	Columbus AFB	004000AMSL	SURFACE	USAF
A481	USAF, NELLIS AFB	Nellis AFB	017000AMSL	07000AMSL	USAF
A530	USMC, CHERRY POINT MCAS	Cherry Point/Camp Lejeune Range Complex	017999AMSL	SURFACE	USMC
A531	USA, FORT BRAGG	Fort Bragg	001500AGL	00200AGL	USA
A561	USAF, SHEPPARD AFB	Sheppard AFB	004000AMSL	SURFACE	USAF
A562A	USAF, VANCE AFB	Vance AFB	010000AMSL	SURFACE	USAF
A562B	USAF, VANCE AFB	Vance AFB	010000AMSL	SURFACE	USAF
A632A	USN, CORPUS CHRISTI NAS	NAS Corpus Christi	018000AMSL	06000AMSL	USN
A632B	USN, CORPUS CHRISTI NAS	NAS Corpus Christi	018000AMSL	SURFACE	USN
A632C	USN, CORPUS CHRISTI NAS	NAS Corpus Christi	018000AMSL	SURFACE	USN
A632D	USN, CORPUS CHRISTI NAS	NAS Corpus Christi	010999AMSL	06000AMSL	USN
A632E	USN, CORPUS CHRISTI NAS	NAS Corpus Christi	008999AMSL	06000AMSL	USN
A632F	USN, CORPUS CHRISTI NAS	NAS Corpus Christi	018000AMSL	03000AGL	USN
A633A	USAF, LAUGHLIN AFB	Laughlin AFB	007000AMSL	SURFACE	USAF
A633B	USAF, LAUGHLIN AFB	Laughlin AFB	004000AMSL	SURFACE	USAF
A635	USAF, RANDOLPH AFB	Randolph AFB	004000AMSL	01500AMSL	USAF
A636	USAF, SHEPPARD AFB	Sheppard AFB	004000AMSL	SURFACE	USAF
A638	USAF, RANDOLPH AFB	Randolph AFB	003000AMSL	SURFACE	USAF
A639A	USAF, USAF ACADEMY	USAF Academy	012000AMSL	03000AGL	USAF
A639B	USAF, USAF ACADEMY	USAF Academy	012000AMSL	03000AGL	USAF
A640	USAF, RANDOLPH AFB	Randolph AFB	007500AMSL	00200AGL	USAF
A680	USN, WHIDBEY NAS APP	Whidbey Island Range Complex	003000AMSL	SURFACE	USN
A682(A)	USAF, TRAVIS AFB	Travis AFB	006000AMSL	SURFACE	USAF
A682(B)	USAF, TRAVIS AFB	Travis AFB	003000AMSL	SURFACE	USAF
A683	WICHITA TRACON	McConnell AFB (184 ARW, KS ANG)	004500AMSL	SURFACE	USAF(ANG)

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
A685	FAA, ATLANTA ARTCC	Camp Merrill	000700AGL	SURFACE	USA
ABEL BRAVO MOA, CA	FAA, LOS ANGELES ARTCC	Yuma Range Complex	018000AMSL	07000AMSL	USMC
ABEL EAST MOA, CA	FAA, LOS ANGELES ARTCC	Yuma Range Complex	012999AMSL	05000AMSL	USMC
ABEL NORTH MOA, CA	FAA, LOS ANGELES ARTCC	Yuma Range Complex	018000AMSL	07000AMSL	USMC
ABEL SOUTH MOA, CA	FAA, LOS ANGELES ARTCC	Yuma Range Complex	018000AMSL	07000AMSL	USMC
ADA EAST MOA, KS	FAA, KANSAS CITY ARTCC	Vance AFB	018000AMSL	07000AMSL	USAF
ADA WEST MOA, KS	FAA, KANSAS CITY ARTCC	Vance AFB	018000AMSL	07000AMSL	USAF
ADIRONDACK A MOA, NY	FAA, BOSTON ARTCC	Adirondack	018000AMSL	06000AMSL	USAF
ADIRONDACK B MOA, NY	FAA, BOSTON ARTCC	Adirondack	018000AMSL	02500AMSL	USAF
ADIRONDACK C MOA, NY	FAA, BOSTON ARTCC	Adirondack	018000AMSL	00100AGL	USAF
ADIRONDACK D MOA, NY	FAA, BOSTON ARTCC	Adirondack	018000AMSL	05000AMSL	USAF
AIRBURST A MOA, CO	FAA, DENVER ARTCC	Buckley ANGB	018000AMSL	01500AGL	USAF(ANG)
AIRBURST B MOA, CO	FAA, DENVER ARTCC	Buckley ANGB	018000AMSL	00500AGL	USAF(ANG)
AIRBURST C MOA, CO	FAA, DENVER ARTCC	Buckley ANGB	008499AMSL	00500AGL	USAF(ANG)
ANNE HIGH MOA, AR	FAA, FORT WORTH ARTCC	Barksdale AFB	018000AMSL	07000AMSL	USAF
ANNE LOW MOA, (XA) AR	FAA, FORT WORTH ARTCC	Barksdale AFB	001500AGL	SURFACE	USAF
ANNE LOW MOA, AR	FAA, FORT WORTH ARTCC	Barksdale AFB	006999AMSL	00100AGL	USAF
AVON EAST HIGH MOA, FL	FAA, MIAMI ARTCC	MacDill AFB	FL180	14000AMSL	USAF
AVON EAST MOA, FL	FAA, MIAMI ARTCC	Avon Park	013999AMSL	00500AGL	USAF
BAGDAD 1 MOA, AZ	FAA, ALBUQUERQUE ARTCC	Luke AFB	018000AMSL	07000AMSL	USAF
BAKERSFIELD MOA, CA	FAA, LOS ANGELES ARTCC	Edwards AFB	018000AMSL	02000AGL	USAF
BARSTOW MOA, CA	FAA, LOS ANGELES ARTCC	Edwards AFB	FL180	00200AGL	USAF
BASINGER MOA, FL	FAA, MIAMI ARTCC	MacDill AFB	005000AMSL	00500AGL	USAF
BEAK A MOA, NM	FAA, ALBUQUERQUE ARTCC	Holloman AFB	018000AMSL	12500AMSL	USAF
BEAK B MOA, NM	FAA, ALBUQUERQUE ARTCC	Holloman AFB	018000AMSL	12500AMSL	USAF
BEAK C MOA, NM	FAA, ALBUQUERQUE ARTCC	Holloman AFB	018000AMSL	12500AMSL	USAF
BEAUFORT 1 MOA, (XA) SC	FAA, JACKSONVILLE ARTCC	MCAS Beaufort/Townsend Range Complex	003000AMSL	SURFACE	USMC
BEAUFORT 1 MOA, SC	FAA, JACKSONVILLE ARTCC	MCAS Beaufort/Townsend Range Complex	010000AMSL	00100AGL	USMC
BEAUFORT 2 MOA, (XA) SC	FAA, JACKSONVILLE ARTCC	MCAS Beaufort/Townsend Range Complex	003000AMSL	SURFACE	USMC
BEAUFORT 2 MOA, SC	FAA, JACKSONVILLE ARTCC	MCAS Beaufort/Townsend Range Complex	007000AMSL	00100AGL	USMC
BEAUFORT 3 MOA, SC	FAA, JACKSONVILLE ARTCC	MCAS Beaufort/Townsend Range Complex	002000AMSL	00100AGL	USMC

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
BEAVER MOA, (XA) MN	FAA, MINNEAPOLIS ARTCC	148 FIG, MN ANG	001500AGL	SURFACE	USAF(ANG)
BEAVER MOA, (XB) MN	FAA, MINNEAPOLIS ARTCC	148 FIG, MN ANG	001500AGL	SURFACE	USAF(ANG)
BEAVER MOA, (XC) MN	FAA, MINNEAPOLIS ARTCC	148 FIG, MN ANG	001500AGL	SURFACE	USAF(ANG)
BEAVER MOA, (XD) MN	FAA, MINNEAPOLIS ARTCC	148 FIG, MN ANG	001500AGL	SURFACE	USAF(ANG)
BEAVER MOA, (XE) MN	FAA, MINNEAPOLIS ARTCC	148 FIG, MN ANG	001500AGL	SURFACE	USAF(ANG)
BEAVER MOA, MN	FAA, MINNEAPOLIS ARTCC	148 FIG, MN ANG	018000AMSL	00300AGL	USAF(ANG)
BENNING MOA, GA	FAA, ATLANTA TRACON	Fort Benning	008000AMSL	00500AGL	USA
BIG BEAR MOA, (XA) MI	FAA, MINNEAPOLIS ARTCC	148 FIG, MN ANG	001500AGL	SURFACE	USAF(ANG)
BIG BEAR MOA, MI	FAA, MINNEAPOLIS ARTCC	148 FIG, MN ANG	018000AMSL	00500AMSL	USAF(ANG)
BIRCH MOA, (XA) AK	FAA, ANCHORAGE ARTCC	Eielson AFB	003000AMSL	SURFACE	USAF
BIRCH MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	004999AMSL	00500AGL	USAF
BIRMINGHAM 2 MOA, (XA) AL	FAA, ATLANTA ARTCC	187 FW, AL ANG	005000AMSL	SURFACE	USAF(ANG)
BIRMINGHAM 2 MOA, (XB) AL	FAA, ATLANTA ARTCC	187 FW, AL ANG	004000AMSL	SURFACE	USAF(ANG)
BIRMINGHAM 2 MOA, (XC) AL	FAA, ATLANTA ARTCC	187 FW, AL ANG	004000AMSL	SURFACE	USAF(ANG)
BIRMINGHAM 2 MOA, AL	FAA, ATLANTA ARTCC	187 FW, AL ANG	009999AMSL	00500AGL	USAF(ANG)
BIRMINGHAM MOA, AL	FAA, ATLANTA ARTCC	187 FW, AL ANG	018000AMSL	10000AMSL	USAF(ANG)
BISHOP MOA, CA	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	Edwards AFB	018000AMSL	00200AGL	USAF
BISON MOA, (XA) KS	FAA, KANSAS CITY ARTCC	Edwards AFB	001500AGL	SURFACE	USAF
BISON MOA, KS	FAA, KANSAS CITY ARTCC	Edwards AFB	018000AMSL	01000AGL	USAF
BOARDMAN MOA, OR	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	018000AMSL	04000AMSL	USN
BRADY HIGH MOA, TX	FAA, HOUSTON ARTCC	Fort Worth NAS JRB	018000AMSL	06000AMSL	USN
BRADY LOW MOA, (XA) TX	FAA, HOUSTON ARTCC	Fort Worth NAS JRB	001500AGL	SURFACE	USN
BRADY LOW MOA, (XB) TX	FAA, HOUSTON ARTCC	Fort Worth NAS JRB	001500AGL	SURFACE	USN
BRADY LOW MOA, TX	FAA, HOUSTON ARTCC	Fort Worth NAS JRB	005999AMSL	00500AGL	USN
BRADY NORTH MOA, TX	FAA, FORT WORTH ARTCC	Fort Worth NAS JRB	018000AMSL	03600AMSL	USN
BRISTOL MOA, CA	FAA, LOS ANGELES ARTCC	Twentynine Palms Range Complex	018000AMSL	05000AMSL	USMC
BRONCO 1 MOA, TX	FAA, FORT WORTH ARTCC	Cannon AFB	018000AMSL	08000AMSL	USAF
BRONCO 2 MOA, TX	FAA, FORT WORTH ARTCC	Cannon AFB	018000AMSL	10000AMSL	USAF
BRONCO 3 MOA, TX	FAA, FORT WORTH ARTCC	Cannon AFB	018000AMSL	10000AMSL	USAF
BRONCO 4 MOA, TX	FAA, FORT WORTH ARTCC	Cannon AFB	018000AMSL	10000AMSL	USAF
BROWNWOOD 1 EAST MOA, TX	FAA, FORT WORTH ARTCC	Fort Worth NAS JRB	018000AMSL	07000AMSL	USN
BROWNWOOD 1 WEST MOA, TX	FAA, FORT WORTH ARTCC	Fort Worth NAS JRB	018000AMSL	07000AMSL	USN
BROWNWOOD 2 EAST MOA, TX	FAA, FORT WORTH ARTCC	Fort Worth NAS JRB	018000AMSL	07000AMSL	USN

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
BROWNWOOD 2 WEST MOA, TX	FAA, FORT WORTH ARTCC	Fort Worth NAS JRB	018000AMSL	07000AMSL	USN
BROWNWOOD 3 MOA, TX	FAA, FORT WORTH ARTCC	Fort Worth NAS JRB	018000AMSL	13000AMSL	USN
BROWNWOOD 4 MOA, TX	FAA, FORT WORTH ARTCC	Fort Worth NAS JRB	018000AMSL	13000AMSL	USN
BRUSH CREEK MOA, OH	FAA, INDIANAPOLIS ARTCC	123 ACS, OH ANG	004999AMSL	00100AGL	USAF(ANG)
BUCKEYE MOA, OH	FAA, INDIANAPOLIS ARTCC	123 ACS, OH ANG	018000AMSL	05000AMSL	USAF(ANG)
BUCKHORN MOA, CA	FAA, LOS ANGELES ARTCC	Edwards AFB	018000AMSL	00200AGL	USAF
BUFFALO MOA, (XA) AK	FAA, ANCHORAGE ARTCC	FAA, ANCHORAGE ARTCC	003000AMSL	SURFACE	USAF
BUFFALO MOA, (XB) AK	FAA, ANCHORAGE ARTCC	FAA, ANCHORAGE ARTCC	003500AMSL	SURFACE	USAF
BUFFALO MOA, (XC) AK	FAA, ANCHORAGE ARTCC	FAA, ANCHORAGE ARTCC	001500AGL	SURFACE	USAF
BUFFALO MOA, (XD) AK	FAA, ANCHORAGE ARTCC	FAA, ANCHORAGE ARTCC	001500AGL	SURFACE	USAF
BUFFALO MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	006999AMSL	00300AGL	USAF
BULLDOG A MOA, (XA) GA	FAA, ATLANTA ARTCC	Shaw AFB	001500AGL	SURFACE	USAF
BULLDOG A MOA, (XB) GA	FAA, ATLANTA ARTCC	Shaw AFB	001500AGL	SURFACE	USAF
BULLDOG A MOA, (XC) GA	FAA, ATLANTA ARTCC	Shaw AFB	001500AGL	SURFACE	USAF
BULLDOG A MOA, GA	FAA, ATLANTA ARTCC	Shaw AFB	009999AMSL	00500AGL	USAF
BULLDOG B MOA, GA	FAA, ATLANTA ARTCC	Shaw AFB	018000AMSL	10000AMSL	USAF
BULLDOG C MOA, (XA) GA	FAA, ATLANTA ARTCC	Shaw AFB	001500AGL	SURFACE	USAF
BULLDOG C MOA, GA	FAA, ATLANTA ARTCC	Shaw AFB	009999AMSL	00500AGL	USAF
BULLDOG D MOA, (XA) GA	FAA, ATLANTA ARTCC	Shaw AFB	001500AGL	SURFACE	USAF
BULLDOG D MOA, GA	FAA, ATLANTA ARTCC	Shaw AFB	017000AMSL	00500AGL	USAF
BULLDOG E MOA, GA	FAA, ATLANTA ARTCC	Shaw AFB	009999AMSL	05000AMSL	USAF
BULLSEYE 1 MOA, MS	FAA, HOUSTON ARTCC	CRTC Gulfport	FL180	10000AMSL	USAF(ANG)
BULLSEYE 2 MOA, MS	FAA, HOUSTON ARTCC	CRTC Gulfport	FL180	05000AMSL	USAF(ANG)
BULLSEYE 3 MOA, MS	FAA, HOUSTON ARTCC	CRTC Gulfport	FL180	11000AMSL	USAF(ANG)
CAMDEN RIDGE MOA, (XA) AL	FAA, ATLANTA ARTCC	187 FW, AL ANG	004000AMSL	SURFACE	USAF(ANG)
CAMDEN RIDGE MOA, AL	FAA, ATLANTA ARTCC	187 FW, AL ANG	009999AMSL	00500AGL	USAF(ANG)
CAMPBELL 1 MOA, KY	FAA, MEMPHIS ARTCC	Fort Campbell	010000AMSL	00500AGL	USA
CAMPBELL 2 MOA, (XA) KY	FAA, MEMPHIS ARTCC	Fort Campbell	002500AGL	SURFACE	USA
CAMPBELL 2 MOA, KY	FAA, MEMPHIS ARTCC	Fort Campbell	010000AMSL	01500AGL	USA
CANNON A MOA, MO	FAA, KANSAS CITY ARTCC	131 TFW, Det 1, MO ANG	018000AMSL	00300AGL	USAF(ANG)
CANNON B MOA, MO	FAA, KANSAS CITY ARTCC	131 TFW, Det 1, MO ANG	018000AMSL	00100AGL	USAF(ANG)
CARSON MOA, NV	FAA, OAKLAND ARTCC	Fallon Range Complex	018000AMSL	00500AGL	USN
CARTHAGE EAST, NY	FAA, BOSTON ARTCC	174 FW, NY ANG	018000AMSL	00100AGL	USAF(ANG)
CARTHAGE WEST, NY	FAA, BOSTON ARTCC	174 FW, NY ANG	018000AMSL	06000AMSL	USAF(ANG)

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
CATO MOA, NM	FAA, ALBUQUERQUE ARTCC	Kirtland AFB	FL180	13500AMSL	USAF
CHINA MOA, CA	FAA, OAKLAND ARTCC	Beale AFB	018000AMSL	03000AGL	USAF
CHINOOK A MOA, WA	USN, WHIDBEY IS NAS APP	Whidbey Island Range Complex	005000AMSL	00300AMSL	USN
CHINOOK B MOA, WA	USN, WHIDBEY IS NAS APP	Whidbey Island Range Complex	005000AMSL	00300AMSL	USN
CHURCHILL HIGH MOA, NV	FAA, OAKLAND ARTCC	Fallon Range Complex	018000AMSL	09000AMSL	USN
CHURCHILL LOW MOA, NV	FAA, OAKLAND ARTCC	Fallon Range Complex	009000AMSL	00500AGL	USN
CLAIBORNE A MOA, LA	USA, POLK APP CON	Claiborne	009999AMSL	00100AGL	USAF
CLAIBORNE B MOA, LA	USA, POLK APP CON	Claiborne	018000AMSL	10000AMSL	USAF
COASTAL 1 EAST MOA, GA	FAA, JACKSONVILLE ARTCC	MCAS Beaufort/Townsend Range Complex	018000AMSL	00300AGL	USMC
COASTAL 1 WEST MOA, GA	FAA, JACKSONVILLE ARTCC	MCAS Beaufort/Townsend Range Complex	018000AMSL	00300AGL	USMC
COASTAL 2 MOA, GA	FAA, JACKSONVILLE ARTCC	MCAS Beaufort/Townsend Range Complex	018000AMSL	00300AGL	USMC
COASTAL 4 MOA, GA	FAA, JACKSONVILLE ARTCC	MCAS Beaufort/Townsend Range Complex	018000AMSL	14000AMSL	USMC
COASTAL 5 MOA, GA	FAA, JACKSONVILLE ARTCC	MCAS Beaufort/Townsend Range Complex	018000AMSL	00300AGL	USMC
COASTAL 6 MOA, GA	FAA, JACKSONVILLE ARTCC	MCAS Beaufort/Townsend Range Complex	018000AMSL	10001AMSL	USMC
COASTAL 7 MOA, GA	FAA, JACKSONVILLE CNTR	MCAS Beaufort/Townsend Range Complex	018000AMSL	10001AMSL	USMC
COASTAL 8 MOA, GA	FAA, JACKSONVILLE ARTCC	MCAS Beaufort/Townsend Range Complex	018000AMSL	11000AMSL	USMC
COLUMBUS 1 MOA, MS	FAA, MEMPHIS ARTCC	Columbus AFB	018000AMSL	08000AMSL	USAF
COLUMBUS 2 MOA, MS	FAA, MEMPHIS ARTCC	Columbus AFB	018000AMSL	08000AMSL	USAF
COLUMBUS 3 MOA, MS	FAA, MEMPHIS ARTCC	Columbus AFB	018000AMSL	08000AMSL	USAF
COLUMBUS 4 MOA, MS	FAA, MEMPHIS ARTCC	Columbus AFB	018000AMSL	10000AMSL	USAF
CONDOR 1 MOA, ME	FAA, BOSTON ARTCC	NE ADS/DOOS, NY ANG	018000AMSL	07000AMSL	USAF(ANG)
CONDOR 2 MOA, ME	FAA, BOSTON ARTCC	NE ADS/DOOS, NY ANG	018000AMSL	07000AMSL	USAF(ANG)
CORE MOA, NC	USMC, CHERRY POINT APP CON	Cherry Point/Camp Lejeune Range Complex	FL180	03000AMSL	USMC
COUGAR HIGH MOA, CO	FAA, DENVER ARTCC	Buckley ANGB	FL180	11000AMSL	USAF(ANG)
COUGAR LOW MOA (XA), CO	FAA, DENVER ARTCC	Buckley ANGB	001500AGL	SURFACE	USAF(ANG)
COUGAR LOW MOA (XD), CO	FAA, DENVER ARTCC	Buckley ANGB	005000AGL	SURFACE	USAF(ANG)
COUGAR LOW MOA, CO	FAA, DENVER ARTCC	Buckley ANGB	010999AMSL	00500AGL	USAF(ANG)

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
CRANBERRY MOA, NY	FAA, BOSTON ARTCC	Fort Drum	006000AMSL	00500AGL	USA
CRYPT CENTRAL MOA, IA	FAA, MINNEAPOLIS ARTCC	132 FW, IA ANG	018000AMSL	08000AMSL	USAF(ANG)
CRYPT NORTH MOA, IA	FAA, MINNEAPOLIS ARTCC	132 FW, IA ANG	018000AMSL	08000AMSL	USAF(ANG)
CRYPT SOUTH MOA, IA	FAA, MINNEAPOLIS ARTCC	132 FW, IA ANG	018000AMSL	08000AMSL	USAF(ANG)
CRYSTAL MOA, TX	FAA, HOUSTON ARTCC	Laughlin AFB	018000AMSL	06000AMSL	USAF
CRYSTAL NORTH MOA, TX	FAA, HOUSTON ARTCC	Laughlin AFB	018000AMSL	06000AMSL	USAF
DE SOTO 1 MOA, (XA) MS	FAA, HOUSTON ARTCC	CRTC Gulfport	003000AGL	SURFACE	USAF(ANG)
DE SOTO 1 MOA, MS	FAA, HOUSTON ARTCC	CRTC Gulfport	010000AMSL	00500AGL	USAF(ANG)
DE SOTO 2 MOA, MS	FAA, HOUSTON ARTCC	CRTC Gulfport	005000AMSL	00100AGL	USAF(ANG)
DEEPWOODS MOA, ME	FAA, BANGOR TRACON	CO, Army Avn Support Fac/ME ANG	003000AMSL	SURFACE	USAF(ANG)
DELTA 1 MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	FL180	10000AMSL	USAF
DELTA 2 MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	FL180	05000AMSL	USAF
DELTA 3 MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	FL180	03000AGL	USAF
DELTA 4 MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	FL180	07000AMSL	USAF
DEMO 1 MOA, VA	FAA, POTOMAC TRACON	Quantico Range Complex	005000AMSL	00500AMSL	USMC
DEMO 2 MOA, VA	FAA, POTOMAC TRACON	Quantico Range Complex	015000AMSL	10000AMSL	USMC
DEMO 3 MOA, VA	FAA, POTOMAC TRACON	Quantico Range Complex	015000AMSL	05000AMSL	USMC
DESERT MOA, (XA) NV	FAA, LOS ANGELES ARTCC	Nellis AFB	001500AGL	SURFACE	USAF
DESERT MOA, (XB) NV	FAA, LOS ANGELES ARTCC	Nellis AFB	001500AGL	SURFACE	USAF
DESERT MOA, NV	FAA, LOS ANGELES ARTCC	Nellis AFB	018000AMSL	00100AGL	USAF
DEVILS LAKE EAST MOA, ND	FAA, MINNEAPOLIS ARTCC	McChord AFB	018000AMSL	03500AMSL	USAF
DEVILS LAKE WEST MOA, ND	FAA, MINNEAPOLIS ARTCC	McChord AFB	018000AMSL	04000AMSL	USAF
DOLPHIN NORTH MOA, OR	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	018000AMSL	11000AMSL	USN
DOLPHIN SOUTH MOA, OR	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	018000AMSL	11000AMSL	USN
DOVE MOA, AZ	FAA, LOS ANGELES ARTCC	Yuma Range Complex	018000AMSL	06000AMSL	USMC
DRUM MOA, NY	WHEELER SACKS APP CON	Fort Drum	005000AMSL	00500AGL	USA
DUKE MOA, PA	FAA, CLEVELAND ARTCC	112 ACS/DOT, PA ANG	018000AMSL	08000AMSL	USAF(ANG)
EGLIN A EAST MOA, FL	FAA, JACKSONVILLE ARTCC	Eglin AFB	018000AMSL	01000AGL	USAF
EGLIN A WEST MOA, FL	FAA, JACKSONVILLE ARTCC	Eglin AFB	018000AMSL	01000AGL	USAF
EGLIN B MOA, FL	FAA, JACKSONVILLE ARTCC	Eglin AFB	018000AMSL	01000AGL	USAF
EGLIN C MOA, FL	FAA, JACKSONVILLE ARTCC	Eglin AFB	018000AMSL	01000AGL	USAF
EGLIN D MOA, FL	FAA, JACKSONVILLE ARTCC	Eglin AFB	003000AMSL	01000AGL	USAF
EGLIN E MOA, FL	FAA, JACKSONVILLE ARTCC	Eglin AFB	018000AMSL	SURFACE	USAF
EGLIN F MOA, FL	FAA, JACKSONVILLE ARTCC	Eglin AFB	018000AMSL	SURFACE	USAF

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
EIELSON MOA, (XA) AK	FAA, ANCHORAGE ARTCC	Eielson AFB	001500AGL	SURFACE	USAF
EIELSON MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	018000AMSL	00100AGL	USAF
EUREKA HIGH MOA, KS	FAA, KANSAS CITY ARTCC	McConnell AFB (184 ARW, KS ANG)	018000AMSL	06000AMSL	USAF(ANG)
EUREKA LOW MOA, KS	FAA, KANSAS CITY ARTCC	McConnell AFB (184 ARW, KS ANG)	005999AMSL	02500AMSL	USAF(ANG)
EVERS MOA, WV	FAA, WASHINGTON, DC ARTCC	Langley AFB	018000AMSL	01000AGL	USAF
FALLON NORTH 1 MOA, NV	FAA, OAKLAND ARTCC	Fallon Range Complex	017999AMSL	00100AGL	USN
FALLON NORTH 2 MOA, NV	FAA, OAKLAND ARTCC	Fallon Range Complex	017999AMSL	00100AGL	USN
FALLON NORTH 3 MOA, NV	FAA, OAKLAND ARTCC	Fallon Range Complex	017999AMSL	00200AGL	USN
FALLON NORTH 4 MOA, (XA) NV	FAA, OAKLAND ARTCC	Fallon Range Complex	002000AGL	SURFACE	USN
FALLON NORTH 4 MOA, NV	FAA, OAKLAND ARTCC	Fallon Range Complex	017999AMSL	00200AGL	USN
FALLON SOUTH 1 MOA, (XA) NV	FAA, OAKLAND ARTCC	Fallon Range Complex	010500AMSL	SURFACE	USN
FALLON SOUTH 1 MOA, NV	FAA, SALT LAKE CITY ARTCC	Fallon Range Complex	017999AMSL	00100AGL	USN
FALLON SOUTH 2 MOA, (XA) NV	FAA, SALT LAKE CITY ARTCC	Fallon Range Complex	002000AGL	SURFACE	USN
FALLON SOUTH 2 MOA, NV	FAA, SALT LAKE CITY ARTCC	Fallon Range Complex	017999AMSL	00100AGL	USN
FALLON SOUTH 3 MOA, NV	FAA, SALT LAKE CITY ARTCC	Fallon Range Complex	017999AMSL	00100AGL	USN
FALLON SOUTH 4 MOA, (XA) NV	FAA, SALT LAKE CITY ARTCC	Fallon Range Complex	010500AMSL	02000AGL	USN
FALLON SOUTH 4 MOA, NV	FAA, SALT LAKE CITY ARTCC	Fallon Range Complex	017999AMSL	00200AGL	USN
FALLON SOUTH 5 MOA, (XA) NV	FAA, SALT LAKE CITY ARTCC	Fallon Range Complex	010500AMSL	02000AGL	USN
FALLON SOUTH 5 MOA, NV	FAA, SALT LAKE CITY ARTCC	Fallon Range Complex	017999AMSL	00200AGL	USN
FALLS 1 MOA, (XA) WI	FAA, MINNEAPOLIS ARTCC	Volk Field ANGB	001500AGL	SURFACE	USAF(ANG)
FALLS 1 MOA, WI	FAA, MINNEAPOLIS ARTCC	Volk Field ANGB	018000AMSL	00500AGL	USAF(ANG)
FALLS 2 MOA, (XA) WI	FAA, MINNEAPOLIS ARTCC	Volk Field ANGB	001500AGL	SURFACE	USAF(ANG)
FALLS 2 MOA, WI	FAA, MINNEAPOLIS ARTCC	Volk Field ANGB	018000AMSL	00500AGL	USAF(ANG)
FARMVILLE MOA, (XA) VA	FAA, WASHINGTON, DC ARTCC	Langley AFB	001500AGL	SURFACE	USAF
FARMVILLE MOA, (XB) VA	FAA, WASHINGTON, DC ARTCC	Langley AFB	001500AGL	SURFACE	USAF
FARMVILLE MOA, VA	FAA, WASHINGTON, DC ARTCC	Langley AFB	005000AMSL	00300AGL	USAF
FOOTHILL 1 MOA, CA	FAA, OAKLAND ARTCC	NAS Lemoore	018000AMSL	02000AGL	USN
FOOTHILL 2 MOA, CA	FAA, OAKLAND ARTCC	NAS Lemoore	018000AMSL	02000AGL	USN
FORT BRAGG NORTH AREA A MOA, NC	FAA, FAYETTEVILLE TWR	Fort Bragg	006000AMSL	00500AGL	USA
FORT BRAGG NORTH AREA B MOA, NC	FAA, FAYETTEVILLE TWR	Fort Bragg	006000AMSL	04000AMSL	USA
FORT BRAGG SOUTH AREA A MOA, (XA) NC	FAA, FAYETTEVILLE TWR	Fort Bragg	003000AMSL	SURFACE	USA

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
FORT BRAGG SOUTH AREA A MOA, NC	FAA, FAYETTEVILLE TWR	Fort Bragg	006000AMSL	00500AGL	USA
FORT BRAGG SOUTH AREA B MOA, NC	FAA, FAYETTEVILLE TWR	Fort Bragg	006000AMSL	01500AGL	USA
FORT STEWART B1 MOA, GA	FAA, JACKSONVILLE ARTCC	Fort Stewart	004999AMSL	00500AGL	USA
FORT STEWART B2 MOA, GA	FAA, JACKSONVILLE ARTCC	Fort Stewart	010000AMSL	05000AMSL	USA
FORT STEWART C1 MOA, GA	FAA, JACKSONVILLE ARTCC	Fort Stewart	002999AMSL	00500AGL	USA
FORT STEWART C2 MOA, GA	FAA, JACKSONVILLE ARTCC	Fort Stewart	010000AMSL	03000AMSL	USA
FOX 1 MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	018000AMSL	05000AGL	USAF
FOX 2 MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	018000AMSL	07000AMSL	USAF
FOX 3 MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	018000AMSL	05000AMSL	USAF
FUZZY MOA, AZ	FAA, ALBUQUERQUE ARTCC	Barry M. Goldwater Range	009999AMSL	00100AGL	USAF
GALENA MOA, AK	FAA, ANCHORAGE ARTCC	Elmendorf AFB	018000AMSL	01000AMSL	USAF
GAMECOCK A MOA, NC	FAA, WASHINGTON, DC ARTCC	Shaw AFB (20 OSS/OSOS)	018000AMSL	07000AMSL	USAF
GAMECOCK B MOA, SC	FAA, JACKSONVILLE ARTCC	Shaw AFB	018000AMSL	10000AMSL	USAF
GAMECOCK C MOA, (XA) SC	FAA, JACKSONVILLE ARTCC	Shaw AFB	001500AGL	SURFACE	USAF
GAMECOCK C MOA, (XB) SC	FAA, JACKSONVILLE ARTCC	Shaw AFB	001500AGL	SURFACE	USAF
GAMECOCK C MOA, SC	FAA, JACKSONVILLE ARTCC	Shaw AFB	010000AMSL	00100AGL	USAF
GAMECOCK D MOA, SC	FAA, JACKSONVILLE ARTCC	Shaw AFB	018000AMSL	10000AMSL	USAF
GAMECOCK I MOA, SC	FAA, JACKSONVILLE ARTCC	Shaw AFB	006000AMSL	00100AGL	USAF
GANDY MOA, UT	FAA, SALT LAKE CITY ARTCC	Hill AFB	018000AMSL	00100AGL	USAF
GAP B HIGH MOA, MT	FAA, SALT LAKE ARTCC	Ellsworth AFB	FL180	12000AMSL	USAF
GAP B LOW MOA, MT	FAA, SALT LAKE ARTCC	Ellsworth AFB	011999AMSL	00500AGL	USAF
GLADDEN 1 MOA, AZ	FAA, ALBUQUERQUE ARTCC	Luke AFB	018000AMSL	05000AGL	USAF
GOOSE NORTH MOA, OR	FAA, SEATTLE ARTCC	Kingsley Fld	018000AMSL	03000AGL	USAF(ANG)
GOOSE SOUTH MOA, OR	FAA, SEATTLE ARTCC	Kingsley Fld	018000AMSL	10000AMSL	USAF(ANG)
GRAY MOA, TX	FAA, HOUSTON ARTCC	Fort Hood	010000AMSL	02000AMSL	USA
HACKETT MOA, (XA) LA	FAA, FORT WORTH ARTCC	Barksdale AFB	010000AMSL	07000AMSL	USAF
HACKETT MOA, LA	FAA, FORT WORTH ARTCC	Barksdale AFB	018000AMSL	07000AMSL	USAF
HART NORTH MOA, OR	FAA, SEATTLE ARTCC	173 FW, OR ANG	FL180	11000AMSL	USAF(ANG)
HART SOUTH MOA, OR	FAA, SEATTLE ARTCC	173 FW, OR ANG	FL180	11000AMSL	USAF(ANG)
HATTERAS F MOA, NC	FAA, WASHINGTON, DC ARTCC	Cherry Point/Camp Lejeune Range Complex	013000AMSL	03000AMSL	USMC
HAYS MOA, MT	FAA, SALT LAKE CITY ARTCC	120 FW, MT ANG	018000AMSL	00300AGL	USAF(ANG)
HERSEY MOA, MI	FAA, MINNEAPOLIS ARTCC	110 TASG, MI ANG	018000AMSL	05000AMSL	USAF(ANG)

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
HILL MOA, VA	FAA, POTOMAC APP	Fort A.P. Hill	003000AMSL	SURFACE	USA
HILL TOP MOA, IN	FAA, CHICAGO ARTCC	122nd FW	018000AMSL	10000AMSL	USAF(ANG)
HOG HIGH NORTH MOA, AR	FAA, MEMPHIS ARTCC	Fort Smith	018000AMSL	06000AMSL	USAF
HOG HIGH SOUTH MOA, AR	FAA, MEMPHIS ARTCC	Fort Smith	018000AMSL	06000AMSL	USAF
HOG LOW NORTH MOA, (XA) AR	FAA, MEMPHIS ARTCC	Fort Smith	001500AGL	SURFACE	USAF(ANG)
HOG LOW NORTH MOA, (XB) AR	FAA, MEMPHIS ARTCC	Fort Smith	001500AGL	SURFACE	USAF(ANG)
HOG LOW NORTH MOA, AR	FAA, MEMPHIS ARTCC	Fort Smith	005999AMSL	00100AGL	USAF
HOG LOW SOUTH MOA, (XA) AR	FAA, MEMPHIS ARTCC	Fort Smith	001500AGL	SURFACE	USAF(ANG)
HOG LOW SOUTH MOA, AR	FAA, MEMPHIS ARTCC	Fort Smith	005999AMSL	00100AGL	USAF
HOLLIS MOA, OK	FAA, FORT WORTH ARTCC	Sheppard AFB	018000AMSL	11000AMSL	USAF
HOOD MOA, TX	FAA, HOUSTON ARTCC	Fort Hood	010000AMSL	02000AMSL	USA
HOOD MOA, TX	FAA, HOUSTON ARTCC	Fort Hood	FL180	10000AMSL	USA
HOWARD EAST MOA, IL	FAA, KANSAS CITY ARTCC	Springfield	018000AMSL	09000AMSL	USA
HOWARD WEST MOA, IL	FAA, KANSAS CITY ARTCC	Springfield	018000AMSL	10000AMSL	USA
HUNTER HIGH MOA, CA	FAA, OAKLAND ARTCC	NAS Lemoore	018000AMSL	11000AMSL	USN
HUNTER LOW A MOA, CA	FAA, OAKLAND ARTCC	NAS Lemoore	010999AMSL	00200AGL	USN
HUNTER LOW B MOA, CA	FAA, OAKLAND ARTCC	NAS Lemoore	010999AMSL	02000AGL	USN
HUNTER LOW C MOA, CA	FAA, OAKLAND ARTCC	NAS Lemoore	010999AMSL	03000AGL	USN
HUNTER LOW D MOA, CA	FAA, OAKLAND ARTCC	NAS Lemoore	006000AMSL	01500AGL	USN
HUNTER LOW E MOA, CA	FAA, OAKLAND ARTCC	NAS Lemoore	003000AMSL	01500AGL	USN
ISABELLA MOA, (XA) CA	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	Edwards AFB	001500AGL	SURFACE	USAF
ISABELLA MOA, (XB) CA	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	Edwards AFB	001500AGL	SURFACE	USAF
ISABELLA MOA, (XC) CA	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	Edwards AFB	001500AGL	SURFACE	USAF
ISABELLA MOA, (XD) CA	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	Edwards AFB	001500AGL	SURFACE	USAF
ISABELLA MOA, (XE) CA	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	Edwards AFB	001500AGL	SURFACE	USAF
ISABELLA MOA, (XF) CA	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	Edwards AFB	001500AGL	SURFACE	USAF
ISABELLA MOA, (XG) CA	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	Edwards AFB	001500AGL	SURFACE	USAF
ISABELLA MOA, (XH) CA	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	Edwards AFB	001500AGL	SURFACE	USAF

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
ISABELLA MOA, (XI) CA	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	Edwards AFB	004800AMSL	SURFACE	USAF
ISABELLA MOA, (XJ) CA	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	Edwards AFB	004800AMSL	SURFACE	USAF
ISABELLA MOA, CA	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	Edwards AFB	018000AMSL	00200AGL	USAF
JACKAL LOW MOA, (XA) AZ	FAA, ALBUQUERQUE ARTCC	162 FW, AZ ANG	001500AGL	SURFACE	USAF(ANG)
JACKAL LOW MOA, AZ	FAA, ALBUQUERQUE ARTCC	162 FW, AZ ANG	010999AMSL	00100AGL	USAF(ANG)
JACKAL MOA, AZ	FAA, ALBUQUERQUE ARTCC	162 FW, AZ ANG	018000AMSL	11000AMSL	USAF(ANG)
JARBIDGE MOA, (XA) ID	FAA, SALT LAKE CITY ARTCC	Mt. Home AFB	001500AGL	SURFACE	USAF
JARBIDGE MOA, (XB) ID	FAA, SALT LAKE CITY ARTCC	Mt. Home AFB	002000AGL	SURFACE	USAF
JARBIDGE MOA, (XC) ID	FAA, SALT LAKE CITY ARTCC	Mt. Home AFB	000500AGL	SURFACE	USAF
JARBIDGE NORTH MOA, ID	FAA, SALT LAKE CITY ARTCC	Mt. Home AFB	017999AMSL	00100AGL	USAF
JARBIDGE SOUTH MOA, ID	FAA, SALT LAKE CITY ARTCC	Mt. Home AFB	017999AMSL	03000AGL	USAF
JENA MOA, (XA) LA	FAA, HOUSTON ARTCC	Barksdale AFB	001500AGL	SURFACE	USAF
JENA MOA, (XB) LA	FAA, HOUSTON ARTCC	Barksdale AFB	001500AGL	SURFACE	USAF
JENA MOA, (XC) LA	FAA, HOUSTON ARTCC	Barksdale AFB	001500AGL	SURFACE	USAF
JENA MOA, (XD) LA	FAA, HOUSTON ARTCC	Barksdale AFB	001500AGL	SURFACE	USAF
JENA MOA, LA	FAA, HOUSTON ARTCC	Barksdale AFB	005000AMSL	00100AGL	USAF
JPG A MOA (A), IN	FAA, INDIANAOPPLIS ARTCC	Jefferson Proving Ground	005999AMSL	00500AGL	USAF(ANG)
JPG A MOA (B), IN	FAA, INDIANAOPPLIS ARTCC	Jefferson Proving Ground	005999AMSL	04000AMSL	USAF(ANG)
JPG B MOA, IN	FAA, INDIANAOPPLIS ARTCC	Jefferson Proving Ground	018000AMSL	06000AMSL	USAF(ANG)
JPG C MOA, IN	FAA, INDIANAOPPLIS ARTCC	Jefferson Proving Ground	018000AMSL	06000AMSL	USAF(ANG)
JPG D MOA, IN	FAA, INDIANAOPPLIS ARTCC	Jefferson Proving Ground	004000AMSL	00500AGL	USAF(ANG)
JUNIPER LOW MOA, (XA) OR	FAA, SEATTLE ARTCC	173rd FW	001500AGL	SURFACE	USAF(ANG)
JUNIPER LOW MOA, (XB) OR	FAA, SEATTLE ARTCC	173rd FW	001500AGL	SURFACE	USAF(ANG)
JUNIPER LOW MOA, OR	FAA, SEATTLE ARTCC	173rd FW	010999AMSL	00300AGL	USAF(ANG)
JUNIPER NORTH MOA, OR	FAA, SEATTLE ARTCC	173rd FW	018000AMSL	11000AMSL	USAF(ANG)
JUNIPER SOUTH MOA, OR	FAA, SEATTLE ARTCC	173rd FW	018000AMSL	11000AMSL	USAF(ANG)
KANE EAST MOA, CA	FAA, LOS ANGELES ARTCC	Yuma Range Complex	018000AMSL	10000AMSL	USMC
KANE SOUTH MOA, CA	FAA, LOS ANGELES ARTCC	Yuma Range Complex	018000AMSL	10000AMSL	USMC
KANE WEST MOA, CA	FAA, LOS ANGELES ARTCC	Yuma Range Complex	018000AMSL	10000AMSL	USMC
KINGSVILLE 1 MOA, TX	FAA, HOUSTON ARTCC	GOMEX Range Complex	018000AMSL	08000AMSL	USN
KINGSVILLE 2 MOA, TX	FAA, HOUSTON ARTCC	GOMEX Range Complex	018000AMSL	13000AMSL	USN

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
KINGSVILLE 3 MOA, TX	FAA, HOUSTON ARTCC	GOMEX Range Complex	018000AMSL	08000AMSL	USN
KINGSVILLE 4 MOA, TX	FAA, HOUSTON ARTCC	GOMEX Range Complex	018000AMSL	09000AMSL	USN
KINGSVILLE 5 MOA, TX	FAA, HOUSTON ARTCC	GOMEX Range Complex	018000AMSL	09000AMSL	USN
LA VETA HIGH MOA, CO	FAA, DENVER ARTCC	Buckley ANGB	018000AMSL	13000AMSL	USAF(ANG)
LA VETA LOW MOA, CO	FAA, DENVER ARTCC	Buckley ANGB	013000AMSL	01500AGL	USAF(ANG)
LAKE ANDES MOA, SD	FAA, MINNEAPOLIS ARTCC	Sioux Falls	018000AMSL	06000AMSL	USA
LAKE PLACID EAST MOA, FL	FAA, MIAMI ARTCC	MacDill AFB	FL180	07000AMSL	USAF
LAKE PLACID NORTH MOA, FL	FAA, MIAMI ARTCC	MacDill AFB	FL180	07000AMSL	USAF
LAKE PLACID WEST MOA, FL	FAA, MIAMI ARTCC	MacDill AFB	FL180	07000AMSL	USAF
LANCER MOA, TX	FAA, FORT WORTH ARTCC	Dyess AFB	018000AMSL	06200AMSL	USAF
LAUGHLIN 1 MOA, TX	FAA, HOUSTON ARTCC	Laughlin AFB	018000AMSL	09000AMSL	USAF
LAUGHLIN 2 MOA, TX	FAA, HOUSTON ARTCC	Laughlin AFB	018000AMSL	07000AMSL	USAF
LAUGHLIN 3 HIGH MOA, TX	FAA, HOUSTON ARTCC	Laughlin AFB	FL180	15000AMSL	USAF
LAUGHLIN 3 LOW MOA, TX	FAA, HOUSTON ARTCC	Laughlin AFB	014999AMSL	07000AMSL	USAF
LEMOORE A MOA, CA	FAA, OAKLAND ARTCC	NOCAL Range Complex	FL180	05000AMSL	USN
LEMOORE B MOA, CA	FAA, OAKLAND ARTCC	NOCAL Range Complex	FL180	13000AMSL	USN
LEMOORE C MOA, CA	FAA, OAKLAND ARTCC	NOCAL Range Complex	FL180	16000AMSL	USN
LEMOORE D MOA, CA	FAA, OAKLAND ARTCC	NOCAL Range Complex	FL180	05000AMSL	USN
LEMOORE E MOA, CA	FAA, OAKLAND ARTCC	NOCAL Range Complex	FL180	05000AMSL	USN
LINCOLN MOA, NE	FAA, MINNEAPOLIS ARTCC	155 TRG, NE ANG	018000AMSL	08000AMSL	USAF(ANG)
LINDBERGH A MOA, MO	FAA, KANSAS CITY ARTCC	131 TFW, Det 1, MO ANG	018000AMSL	07000AMSL	USAF(ANG)
LINDBERGH B MOA, MO	FAA, KANSAS CITY ARTCC	131 TFW, Det 1, MO ANG	018000AMSL	08000AMSL	USAF(ANG)
LINDBERGH C MOA, MO	FAA, KANSAS CITY ARTCC	131 TFW, Det 1, MO ANG	018000AMSL	08000AMSL	USAF(ANG)
LIVE OAK MOA, FL	FAA, JACKSONVILLE ARTCC	Moody AFB	018000AMSL	08000AMSL	USAF
LOWVILLE MOA, NY	FAA, BOSTON ARTCC	174 FW, NY ANG	018000AMSL	00100AGL	USAF(ANG)
LUCIN A MOA, UT	FAA, SALT LAKE CITY ARTCC	Hill AFB	009000AMSL	00100AGL	USAF
LUCIN B MOA, UT	FAA, SALT LAKE CITY ARTCC	Hill AFB	007500AMSL	00100AGL	USAF
LUCIN C MOA, UT	FAA, SALT LAKE CITY ARTCC	Hill AFB	006500AMSL	00100AGL	USAF
MARIAN MOA, FL	FAA, MIAMI ARTCC	MacDill AFB	005000AMSL	00500AGL	USAF
MAXWELL 1 MOA, CA	FAA, OAKLAND ARTCC	Beale AFB	018000AMSL	11000AMSL	USAF
MAXWELL 2 MOA, CA	FAA, OAKLAND ARTCC	Beale AFB	018000AMSL	11000AMSL	USAF
MAXWELL 3 MOA, CA	FAA, OAKLAND ARTCC	Beale AFB	018000AMSL	11000AMSL	USAF
MAYPORT HIGH MOA, FL	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	018000AMSL	03000AMSL	USN
MAYPORT LOW MOA, FL	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	002999AMSL	00500AMSL	USN

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
MERIDIAN 1 EAST MOA, MS	FAA, MEMPHIS ARTCC	Meridian Complex	018000AMSL	08000AMSL	USN
MERIDIAN 1 WEST MOA, MS	FAA, MEMPHIS ARTCC	Meridian Complex	018000AMSL	08000AMSL	USN
MINNOW MOA, WI	FAA, MINNEAPOLIS ARTCC	Volk Field ANGB	018000AMSL	10000AMSL	USAF(ANG)
MISTY 1 MOA, NY	FAA, CLEVELAND ARTCC	174 FW, NY ANG	018000AMSL	04000AMSL	USAF(ANG)
MISTY 2 MOA, NY	FAA, CLEVELAND ARTCC	174 FW, NY ANG	018000AMSL	00300AGL	USAF(ANG)
MISTY 3 MOA, NY	FAA, CLEVELAND ARTCC	174 FW, NY ANG	018000AMSL	11000AMSL	USAF(ANG)
MOODY 1 MOA, GA	FAA, JACKSONVILLE ARTCC	Moody AFB	018000AMSL	08000AMSL	USAF
MOODY 2 NORTH MOA, GA	FAA, JACKSONVILLE ARTCC	Moody AFB	007999AMSL	00500AGL	USAF
MOODY 2 SOUTH MOA, GA	FAA, JACKSONVILLE ARTCC	Moody AFB	007999AMSL	00100AGL	USAF
MOODY 3 MOA, GA	FAA, JACKSONVILLE ARTCC	Moody AFB	018000AMSL	08000AMSL	USAF
MORENCI MOA, (XA) AZ	FAA, ALBUQUERQUE ARTCC	162 FW, AZ ANG	005000AMSL	SURFACE	USAF(ANG)
MORENCI MOA, AZ	FAA, ALBUQUERQUE ARTCC	162 FW, AZ ANG	018000AMSL	01500AGL	USAF(ANG)
MT DORA EAST HIGH MOA, NM	FAA, ALBUQUERQUE ARTCC	Cannon AFB	018000AMSL	11000AMSL	USAF
MT DORA EAST LOW MOA, NM	FAA, ALBUQUERQUE ARTCC	Cannon AFB	010999AMSL	01500AGL	USAF
MT DORA NORTH HIGH MOA, NM	FAA, ALBUQUERQUE ARTCC	Cannon AFB	018000AMSL	11000AMSL	USAF
MT DORA NORTH LOW MOA, NM	FAA, ALBUQUERQUE ARTCC	Cannon AFB	010999AMSL	01500AGL	USAF
MT DORA WEST HIGH MOA, NM	FAA, ALBUQUERQUE ARTCC	Cannon AFB	018000AMSL	11000AMSL	USAF
MT DORA WEST LOW MOA, NM	FAA, ALBUQUERQUE ARTCC	Cannon AFB	010999AMSL	01500AGL	USAF
NAKNEK 1 MOA, AK	FAA, ANCHORAGE ARTCC	Elmendorf AFB	018000AMSL	03000AGL	USAF
NAKNEK 2 MOA, AK	FAA, ANCHORAGE ARTCC	Elmendorf AFB	018000AMSL	03000AGL	USAF
O NEILL MOA, SD	FAA, MINNEAPOLIS ARTCC	185 FW, IA ANG	018000AMSL	00500AGL	USAF(ANG)
OKANOGAN A MOA, WA	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	018000AMSL	09000AMSL	USN
OKANOGAN B MOA, (XA) WA	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	001500AGL	SURFACE	USN
OKANOGAN B MOA, WA	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	008999AMSL	00300AGL	USN
OKANOGAN C MOA, (XA) WA	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	001500AGL	SURFACE	USN
OKANOGAN C MOA, WA	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	008999AMSL	00300AGL	USN
OLYMPIC A MOA, WA	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	018000AMSL	06000AMSL	USN
OLYMPIC B MOA, WA	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	018000AMSL	06000AMSL	USN
ONTONAGON MOA, (XA) MI	FAA, MINNEAPOLIS ARTCC	Offutt AFB	001500AGL	SURFACE	USAF
ONTONAGON MOA, MI	FAA, MINNEAPOLIS ARTCC	Offutt AFB	018000AMSL	00500AGL	USAF
OUTLAW MOA, AZ	FAA, ALBUQUERQUE ARTCC	162 FW, AZ ANG	018000AMSL	08000AMSL	USAF(ANG)
OWENS MOA, (XA) CA	FAA, JOSHUA CONTROL FAC EDWARDS AFB	Edwards AFB	001500AGL	SURFACE	USAF

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
OWENS MOA, (XB) CA	FAA, JOSHUA CONTROL FAC EDWARDS AFB	Edwards AFB	001500AGL	SURFACE	USAF
OWENS MOA, CA	FAA, JOSHUA CONTROL FAC EDWARDS AFB	Edwards AFB	018000AMSL	00200AGL	USAF
OWYHEE NORTH MOA, (XA) ID	FAA, SALT LAKE CITY ARTCC	Mt. Home AFB	000500AGL	SURFACE	USAF
OWYHEE NORTH MOA, ID	FAA, SALT LAKE CITY ARTCC	Mt. Home AFB	017999AMSL	00100AGL	USAF
OWYHEE SOUTH MOA, ID	FAA, SALT LAKE CITY ARTCC	Mt. Home AFB	017999AMSL	03000AGL	USAF
PALATKA 1 MOA, FL	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	018000AMSL	03000AGL	USN
PALATKA 2 MOA, FL	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	018000AMSL	03000AGL	USN
PAMLICO A MOA, NC	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	FL180	08000AMSL	USN
PAMLICO B MOA, NC	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	FL180	08000AMSL	USN
PANAMINT MOA, (XA) CA	FAA, JOSHUA CONTROL FAC EDWARDS AFB	Edwards AFB	003000AGL	00200AGL	USAF
PANAMINT MOA, (XB) CA	FAA, JOSHUA CONTROL FAC EDWARDS AFB	Edwards AFB	001500AGL	SURFACE	USAF
PANAMINT MOA, CA	FAA, JOSHUA CONTROL FAC EDWARDS AFB	Edwards AFB	018000AMSL	03001AGL	USAF
PARADISE NORTH MOA, OR	FAA, SALT LAKE CITY ARTCC	Mt. Home AFB	017999AMSL	03000AGL	USAF
PARADISE SOUTH MOA, NV	FAA, SALT LAKE CITY ARTCC	Mt. Home AFB	017999AMSL	03000AGL	USAF
PECOS NORTH HIGH MOA, NM	FAA, ALBUQUERQUE ARTCC	Cannon AFB	018000AMSL	11000AMSL	USAF
PECOS NORTH LOW MOA, (XA) NM	FAA, ALBUQUERQUE ARTCC	Cannon AFB	001500AGL	00500AGL	USAF
PECOS NORTH LOW MOA, NM	FAA, ALBUQUERQUE ARTCC	Cannon AFB	010999AMSL	00500AGL	USAF
PECOS SOUTH MOA, NM	FAA, ALBUQUERQUE ARTCC	Cannon AFB	018000AMSL	00500AGL	USAF
PENSACOLA NORTH MOA, FL	FAA, JACKSONVILLE ARTCC	GOMEX Range Complex	018000AMSL	10000AMSL	USN
PENSACOLA SOUTH MOA, FL	FAA, PENSACOLA TOWER	GOMEX Range Complex	018000AMSL	10000AMSL	USN
PHELPS A MOA, NC	FAA, WASHINGTON, DC ARTCC	Seymour-Johnson AFB	FL180	06000AMSL	USAF
PHELPS B MOA, NC	FAA, WASHINGTON, DC ARTCC	Seymour-Johnson AFB	FL180	10000AMSL	USAF
PHELPS C MOA, NC	FAA, WASHINGTON, DC ARTCC	Seymour-Johnson AFB	FL180	15000AMSL	USAF
PICKETT 1 MOA, VA	FAA, WASHINGTON, DC ARTCC	Fort Pickett	006000AMSL	00500AGL	USA
PICKETT 2 MOA, VA	FAA, WASHINGTON, DC ARTCC	Fort Pickett	010000AMSL	00500AGL	USA
PICKETT 3 MOA, VA	FAA, WASHINGTON, DC ARTCC	Fort Pickett	010000AMSL	04000AMSL	USA
PIKE EAST MOA, MI	FAA, MINNEAPOLIS ARTCC	Alpena CRTC	018000AMSL	00300AGL	USAF
PIKE WEST MOA, MI	FAA, MINNEAPOLIS ARTCC	Alpena CRTC	018000AMSL	06000AMSL	USAF
PINE HILL EAST MOA, MS	FAA, ATLANTA ARTCC	Meridian Complex	018000AMSL	10000AMSL	USN
PINE HILL WEST MOA, MS	FAA, ATLANTA ARTCC	Meridian Complex	018000AMSL	10000AMSL	USN

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
PINON CANYON MOA, CO	FAA, DENVER ARTCC	Fort Carson	010000AMSL	00100AGL	USA
POINSETT MOA, (XA) SC	USAF, SHAW APP CON	Shaw AFB	001500AGL	SURFACE	USAF
POINSETT MOA, (XB) SC	USAF, SHAW APP CON	Shaw AFB	001500AGL	SURFACE	USAF
POINSETT MOA, SC	USAF, SHAW APP CON	Shaw AFB	002500AMSL	00300AGL	USAF
PORTERVILLE MOA, CA	FAA, LOS ANGELES CENTER	Edwards AFB	018000AMSL	02000AGL	USAF
POWDER RIVER 2 HIGH MOA, MT	FAA, DENVER ARTCC	Edwards AFB	FL180	12000AMSL	USAF
POWDER RIVER 2 LOW MOA, (XA) MT	FAA, DENVER ARTCC	Edwards AFB	001500AGL	SURFACE	USAF
POWDER RIVER 2 LOW MOA, (XC) MT	FAA, DENVER ARTCC	Edwards AFB	001500AGL	SURFACE	USAF
POWDER RIVER 2 LOW MOA, (XD) MT	FAA, DENVER ARTCC	Edwards AFB	001500AGL	SURFACE	USAF
POWDER RIVER 2 LOW MOA, (XF) MT	FAA, DENVER ARTCC	Edwards AFB	001500AGL	SURFACE	USAF
POWDER RIVER 2 LOW MOA, (XG) MT	FAA, DENVER ARTCC	Edwards AFB	001500AGL	SURFACE	USAF
POWDER RIVER 2 LOW MOA, MT	FAA, DENVER ARTCC	Edwards AFB	011999AMSL	00500AGL	USAF
PRUITT A MOA, (XA) IL	FAA, KANSAS CITY ARTCC	Springfield	001500AGL	SURFACE	USA
PRUITT A MOA, (XB) IL	FAA, KANSAS CITY ARTCC	Springfield	001500AGL	SURFACE	USA
PRUITT A MOA, (XC) IL	FAA, KANSAS CITY ARTCC	Springfield	001500AGL	SURFACE	USA
PRUITT A MOA, IL	FAA, KANSAS CITY ARTCC	Springfield	006000AMSL	00500AGL	USA
PRUITT B MOA, IL	FAA, KANSAS CITY ARTCC	Springfield	003000AMSL	00500AGL	USA
QUAIL MOA, AZ	FAA, LOS ANGELES ARTCC	Yuma Range Complex	018000AMSL	10000AMSL	USMC
R2101	FAA, ATLANTA ARTCC	Anniston Army Depot	005000AMSL	SURFACE	USA
R2102A	FAA, ATLANTA ARTCC	Fort McClellan	008000AMSL	SURFACE	USA
R2102B	FAA, ATLANTA ARTCC	Fort McClellan	014000AMSL	08000AMSL	USA
R2102C	FAA, ATLANTA ARTCC	Fort McClellan	FL240	14000AMSL	USA
R2103A	USA, CAIRNS APP	Fort Rucker	009999AMSL	SURFACE	USA
R2103B	FAA, JACKSONVILLE ARTCC	Fort Rucker	015000AMSL	10000AMSL	USA
R2104A	FAA, MEMPHIS ARTCC	Redstone Arsenal	012000AMSL	SURFACE	USA
R2104B	FAA, MEMPHIS ARTCC	Redstone Arsenal	002400AMSL	SURFACE	USA
R2104C	FAA, MEMPHIS ARTCC	Redstone Arsenal	012000AMSL	SURFACE	USA
R2104D	FAA, MEMPHIS ARTCC	Redstone Arsenal	FL300	12000AMSL	USA
R2104E	FAA, MEMPHIS ARTCC	Redstone Arsenal	FL300	12000AMSL	USA
R2202A	FAA, ANCHORAGE ARTCC	Fort Greely	009999AMSL	SURFACE	USA

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
R2202B	FAA, ANCHORAGE ARTCC	Fort Greely	009999AMSL	SURFACE	USA
R2202C	FAA, ANCHORAGE ARTCC	Fort Greely	FL310	10000AMSL	USA
R2202D	FAA, ANCHORAGE, ARTCC	Fort Greely	UNLTD	FL310	USA
R2203A	FAA, ANCHORAGE APPROACH CONTROL	Fort Richardson	011000AMSL	SURFACE	USA
R2203B	FAA, ANCHORAGE APPROACH CONTROL	Fort Richardson	011000AMSL	SURFACE	USA
R2203C	FAA, ANCHORAGE APPROACH CONTROL	Fort Richardson	005000AMSL	SURFACE	USA
R2205	FAA, FAIRBANKS APP	Fort Richardson	020000AMSL	SURFACE	USA
R2206	FAA, ANCHORAGE ARTCC	13th Missile Wing	008800AMSL	SURFACE	USAF
R2211	FAA, ANCHORAGE ARTCC	Eielson AFB	FL310	SURFACE	USAF
R2301E	FAA, ALBUQUERQUE ARTCC	Luke AFB	FL800	SURFACE	USAF
R2301W	FAA, LOS ANGELES ARTCC	Yuma Range Complex	FL800	SURFACE	USMC
R2302	FAA, ALBUQUERQUE ARTCC	Navajo Ordnance Depot	010000AMSL	SURFACE	USA
R2303A	FAA, ALBUQUERQUE ARTCC	Fort Huachuca	015000AMSL	SURFACE	USA
R2303B	FAA, ALBUQUERQUE ARTCC	Fort Huachuca	FL300	08000AMSL	USA
R2303C	FAA, ALBUQUERQUE ARTCC	Fort Huachuca	FL300	15000AMSL	USA
R2304	FAA, ALBUQUERQUE ARTCC	Luke AFB	FL240	SURFACE	USAF
R2305	FAA, ALBUQUERQUE ARTCC	Luke AFB	FL240	SURFACE	USAF
R2306A	FAA, LOS ANGELES ARTCC	Yuma Proving Ground	FL800	SURFACE	USA
R2306B	FAA, LOS ANGELES ARTCC	Yuma Proving Ground	FL800	SURFACE	USA
R2306C	FAA, LOS ANGELES ARTCC	Yuma Proving Ground	FL400	SURFACE	USA
R2306D	FAA, LOS ANGELES ARTCC	Yuma Proving Ground	FL230	SURFACE	USA
R2306E	FAA, LOS ANGELES ARTCC	Yuma Proving Ground	FL800	SURFACE	USA
R2307	FAA, LOS ANGELES ARTCC	Yuma Proving Ground	UNLTD	SURFACE	USA
R2308A	FAA, LOS ANGELES ARTCC	Yuma Proving Ground	FL800	01500AGL	USA
R2308B	FAA, LOS ANGELES ARTCC	Yuma Proving Ground	FL800	SURFACE	USA
R2308C	FAA, LOS ANGELES ARTCC	Yuma Proving Ground	FL230	01500AGL	USA
R2309	FAA, LOS ANGELES ARTCC	Yuma Proving Ground	015000AMSL	SURFACE	USAF
R2310A	FAA, ALBUQUERQUE ARTCC	Florence Training Site	010000AMSL	SURFACE	USA
R2310B	FAA, ALBUQUERQUE ARTCC	Florence Training Site	017000AMSL	10000AMSL	USA
R2310C	FAA, ALBUQUERQUE ARTCC	Florence Training Site	FL350	17000AMSL	USA
R2311	YUMA APP, YUMA MCAS	Yuma Proving Ground	003500AMSL	SURFACE	USA

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
R2312	LIBBY AAF TWR	McChord AFB	014999AMSL	SURFACE	USAF
R2401A	FAA, MEMPHIS ARTCC	Chaffee	FL300	SURFACE	USA
R2401B	FAA, MEMPHIS ARTCC	Chaffee	FL300	SURFACE	USA
R2402A	FAA, MEMPHIS ARTCC	Chaffee	030000AMSL	SURFACE	USA
R2402B	FAA, MEMPHIS ARTCC	Chaffee	FL220	10000AMSL	USA
R2402C	FAA, MEMPHIS ARTCC	Chaffee	FL220	13000AMSL	USA
R2403A	FAA, MEMPHIS ARTCC	Arkansas ARNG	016000AMSL	SURFACE	USA(ARNG)
R2403B	FAA, MEMPHIS ARTCC	Arkansas ARNG	016000AMSL	SURFACE	USA(ARNG)
R2501E	FAA, LOS ANGELES ARTCC	Twentynine Palms Range Complex	UNLTD	SURFACE	USMC
R2501N	FAA, LOS ANGELES ARTCC	Twentynine Palms Range Complex	UNLTD	SURFACE	USMC
R2501S	FAA, LOS ANGELES ARTCC	Twentynine Palms Range Complex	UNLTD	SURFACE	USMC
R2501W	FAA, LOS ANGELES ARTCC	Twentynine Palms Range Complex	UNLTD	SURFACE	USMC
R2502A	FAA, LOS ANGELES ARTCC, EDWARDS AFB	Fort Irwin	016000AMSL	SURFACE	USA
R2502E	FAA, LOS ANGELES ARTCC	Fort Irwin	UNLTD	SURFACE	USA
R2502N	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	Fort Irwin	UNLTD	SURFACE	USA
R2503A	FAA, LOS ANGELES ARTCC	Camp Pendleton Range Complex	002000AMSL	SURFACE	USMC
R2503B	FAA, LOS ANGELES ARTCC	Camp Pendleton Range Complex	015000AMSL	SURFACE	USMC
R2503C	FAA, LOS ANGELES ARTCC	Camp Pendleton Range Complex	FL270	15000AMSL	USMC
R2503D	FAA, SOCAL TRACON	Camp Pendleton Range Complex	011000AMSL	02000AMSL	USMC
R2504A	FAA, OAKLAND ARTCC	Camp Roberts	005999AMSL	SURFACE	USA
R2504B	FAA, OAKLAND ARTCC	Camp Roberts	015000AMSL	06000AMSL	USA
R2505	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	China Lake Range Complex	UNLTD	SURFACE	USN
R2506	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	China Lake Range Complex	006000AMSL	SURFACE	USN
R2507E	FAA, LOS ANGELES ARTCC	Yuma Range Complex	FL400	SURFACE	USMC
R2507N	FAA, LOS ANGELES ARTCC	Yuma Range Complex	FL400	SURFACE	USMC
R2507S	FAA, LOS ANGELES ARTCC	Yuma Range Complex	FL400	SURFACE	USMC
R2508	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	R-2508 Complex	UNLTD	FL200	USAF
R2510A	FAA, LOS ANGELES ARTCC	El Centro Range Complex	015000AMSL	SURFACE	USN
R2510B	FAA, LOS ANGELES ARTCC	El Centro Range Complex	FL400	15000AMSL	USN
R2512	FAA, LOS ANGELES ARTCC	El Centro Range Complex	FL230	SURFACE	USN

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
R2513	FAA, OAKLAND ARTCC	Fort Hunter-Leggett	FL240	SURFACE	USA
R2515	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	Edwards AFB	UNLTD	SURFACE	USAF
R2516	FAA, LOS ANGELES ARTCC	Vandenberg AFB	UNLTD	SURFACE	USAF
R2517	FAA, LOS ANGELES ARTCC	Vandenberg AFB	UNLTD	SURFACE	USAF
R2519	FAA, LOS ANGELES ARTCC	Pt. Mugu Range Complex	UNLTD	SURFACE	USN
R2524	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	China Lake Range Complex	UNLTD	SURFACE	USN
R2530	FAA, OAKLAND ARTCC	Sierra Army Deport	008600AMSL	SURFACE	USA
R2534A	FAA, LOS ANGELES ARTCC	Vandenberg AFB	UNLTD	00500AGL	USAF
R2534B	FAA, LOS ANGELES ARTCC	Vandenberg AFB	UNLTD	00500AGL	USAF
R2535A	FAA, LOS ANGELES ARTCC	Pt. Mugu Range Complex	100000AMSL	SURFACE	USN
R2535B	FAA, LOS ANGELES ARTCC	Pt. Mugu Range Complex	100000AMSL	SURFACE	USN
R2601A	FAA, DENVER ARTCC	Fort Carson	012499AMSL	SURFACE	USA
R2601B	FAA, DENVER ARTCC	Fort Carson	022499AMSL	12500AMSL	USA
R2601C	FAA, DENVER ARTCC	Fort Carson	034999AMSL	22500AMSL	USA
R2601D	FAA, DENVER ARTCC	Fort Carson	059999AMSL	35000AMSL	USA
R2602	FAA, DENVER ARTCC	Colorado Springs Training Site	001000AGL	SURFACE	USAF
R2901A	FAA, MIAMI ARTCC	Avon Park	014000AMSL	SURFACE	USAF
R2901B	FAA, MIAMI ARTCC	Avon Park	FL180	14000AMSL	USAF
R2901C	FAA, MIAMI ARTCC	Avon Park	014000AMSL	SURFACE	USAF
R2901D	FAA, MIAMI ARTCC	Avon Park	004000AMSL	00500AMSL	USAF
R2901E	FAA, MIAMI ARTCC	Avon Park	004000AMSL	01000AMSL	USAF
R2901F	FAA, MIAMI ARTCC	Avon Park	005000AMSL	04000AMSL	USAF
R2901G	FAA, MIAMI ARTCC	Avon Park	005000AMSL	SURFACE	USAF
R2901H	FAA, MIAMI ARTCC	Avon Park	004000AMSL	01000AMSL	USAF
R2901I	FAA, MIAMI ARTCC	Avon Park	004000AMSL	01500AMSL	USAF
R2901J	FAA, MIAMI ARTCC	Avon Park	FL230	FL180	USAF
R2901K	FAA, MIAMI ARTCC	Avon Park	FL310	FL230	USAF
R2901L	FAA, MIAMI ARTCC	Avon Park	FL400	FL310	USAF
R2901M	FAA, MIAMI ARTCC	Avon Park	014000AMSL	04000AMSL	USAF
R2901N	FAA, MIAMI ARTCC	Avon Park	014000AMSL	04000AMSL	USAF
R2903A	FAA, JACKSONVILLE ARTCC	Camp Blanding	022999AMSL	SURFACE	USA(ARNG)
R2903B	FAA, JACKSONVILLE ARTCC	Camp Blanding	FL320	FL230	USA(ARNG)

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
R2903C	FAA, JACKSONVILLE TRACON	Camp Blanding	007000AMSL	SURFACE	USA(ARNG)
R2903D	FAA, JACKSONVILLE TRACON	Camp Blanding	005000AMSL	SURFACE	USA(ARNG)
R2904A	FAA, JACKSONVILLE TRACON	Camp Blanding	001799AMSL	SURFACE	USA(ARNG)
R2905A	TYNDALL AFB RADAR APP CONTROL	Tyndall AFB	010000AMSL	SURFACE	USAF
R2905B	TYNDALL AFB RADAR APP CONTROL	Tyndall AFB	010000AMSL	SURFACE	USAF
R2906	FAA, JACKSONVILLE TRACON	Jacksonville Range Complex	014000AMSL	SURFACE	USN
R2907A	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	FL230	SURFACE	USN
R2907B	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	FL230	02000AMSL	USN
R2907C	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	001999AMSL	00500AMSL	USN
R2908	FAA, PENSACOLA TRACON	Jacksonville Range Complex	012000AMSL	SURFACE	USN
R2910A	FAA, JACKSONVILLE ARTCC	Camp Blanding	FL230	SURFACE	USA(ARNG)
R2910B	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	006000AMSL	SURFACE	USN
R2910C	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	006000AMSL	SURFACE	USN
R2910D	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	FL230	02000AMSL	USN
R2910E	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	002000AMSL	00500AMSL	USN
R2914A	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	SURFACE	USAF
R2914B	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	08500AMSL	USAF
R2915A	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	SURFACE	USAF
R2915B	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	SURFACE	USAF
R2915C	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	08500AMSL	USAF
R2916	FAA, MIAMI ARTCC	Tyndall AFB	014000AMSL	SURFACE	USAF
R2917	USAF, EGLIN AFB APP	Eglin AFB	005000AMSL	SURFACE	USAF
R2918	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	SURFACE	USAF
R2919A	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	SURFACE	USAF
R2919B	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	08500AMSL	USAF
R2932	FAA, MIAMI ARTCC	Cape Canaveral Range Complex	004999AMSL	SURFACE	USAF
R2933	FAA, MIAMI ARTCC	Cape Canaveral Range Complex	UNLTD	05000AMSL	USAF
R2934	FAA, MIAMI ARTCC	Cape Canaveral Range Complex	UNLTD	SURFACE	USAF
R2935	FAA, MIAMI ARTCC	Cape Canaveral Range Complex	UNLTD	11000AMSL	USAF
R3002A	FAA, ATLANTA TRACON	Fort Benning	004000AMSL	SURFACE	USA
R3002B	FAA, ATLANTA TRACON	Fort Benning	008000AMSL	04000AMSL	USA
R3002C	FAA, ATLANTA TRACON	Fort Benning	014000AMSL	08000AMSL	USA

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
R3002D	FAA, ATLANTA TRACON	Fort Benning	008000AMSL	SURFACE	USA
R3002E	FAA, ATLANTA TRACON	Fort Benning	014000AMSL	08000AMSL	USA
R3002F	FAA, ATLANTA TRACON	Fort Benning	FL250	14000AMSL	USA
R3002G	FAA, ATLANTA TRACON	Fort Benning	014000AMSL	SURFACE	USA
R3004A	FAA, ATLANTA ARTCC	Fort Gordon	007000AMSL	SURFACE	USA
R3004B	FAA, ATLANTA ARTCC	Fort Gordon	016000AMSL	07001AMSL	USA
R3005A	FAA, JACKSONVILLE ARTCC	Fort Stewart	FL290	SURFACE	USA
R3005B	FAA, JACKSONVILLE ARTCC	Fort Stewart	FL290	SURFACE	USA
R3005C	FAA, JACKSONVILLE ARTCC	Fort Stewart	FL290	SURFACE	USA
R3005D	FAA, JACKSONVILLE ARTCC	Fort Stewart	FL290	SURFACE	USA
R3005E	FAA, JACKSONVILLE ARTCC	Fort Stewart	FL290	SURFACE	USA
R3007A	FAA, JACKSONVILLE ARTCC	Townsend	013000AMSL	SURFACE	USAF(ANG)
R3007B	FAA, JACKSONVILLE ARTCC	Townsend	013000AMSL	01200AGL	USAF(ANG)
R3007C	FAA, JACKSONVILLE ARTCC	Townsend	013000AMSL	00100AGL	USAF(ANG)
R3007D	FAA, JACKSONVILLE ARTCC	Townsend	FL250	13000AMSL	USAF(ANG)
R3008A	USAF, VALDOSTA APP	Moody AFB	010000AMSL	SURFACE	USAF
R3008B	USAF, VALDOSTA APP	Moody AFB	010000AMSL	00100AGL	USAF
R3008C	USAF, VALDOSTA APP	Moody AFB	010000AMSL	00500AGL	USAF
R3008C(A)	USAF, VALDOSTA APP	Moody AFB	001500AGL	SURFACE	USAF
R3008D	USAF, VALDOSTA APP	Moody AFB	022999AMSL	10000AMSL	USAF
R3101	FAA, HONOLULU CTL FAC	Hawaiian Islands Range Complex	UNLTD	SURFACE	USN
R3103	FAA, HONOLULU CTL FAC	Pohakuloa Training Area	030000AMSL	SURFACE	USA
R3107	FAA, HONOLULU CTL FAC	Hawaiian Islands Range Complex	FL180	SURFACE	USN
R3109A	FAA, HONOLULU CTL FAC	Schofield-Makua	008999AMSL	SURFACE	USA
R3109B	FAA, HONOLULU CTL FAC	Schofield-Makua	018999AMSL	09000AMSL	USA
R3109C	FAA, HONOLULU CTL FAC	Schofield-Makua	008999AMSL	SURFACE	USA
R3110A	FAA, HONOLULU CTL FAC	Schofield-Makua	008999AMSL	SURFACE	USA
R3110B	FAA, HONOLULU CTL FAC	Schofield-Makua	018999AMSL	09000AMSL	USA
R3110C	FAA, HONOLULU CTL FAC	Schofield-Makua	008999AMSL	SURFACE	USA
R3202	FAA, SALT LAKE CITY ARTCC	Mt. Home AFB	017999AMSL	SURFACE	USAF
R3202(H)	FAA, SALT LAKE CITY ARTCC	Mountain Home AFB	FL290	FL180	USAF
R3203A	FAA, SALT LAKE CITY ARTCC	Mountain Home AFB	015000AMSL	SURFACE	USAF
R3203B	FAA, SALT LAKE CITY ARTCC	Mountain Home AFB	FL220	15000AMSL	USAF

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
R3203C	FAA, SALT LAKE CITY ARTCC	Mountain Home AFB	006000AMSL	SURFACE	USAF
R3203D	FAA, SALT LAKE CITY ARTCC	Boise	FL220	SURFACE	USA
R3204A	FAA, SALT LAKE CITY ARTCC	Mountain Home AFB	000100AGL	SURFACE	USAF
R3204B	FAA, SALT LAKE CITY ARTCC	Mountain Home AFB	018000AMSL	00100AGL	USAF
R3204C	FAA, SALT LAKE CITY ARTCC	Mountain Home AFB	FL290	FL180	USAF
R3401A	FAA, INDIANAPOLIS ARTCC	Camp Atterbury	FL400	SURFACE	USA
R3401B	FAA, INDIANAPOLIS ARTCC	Camp Atterbury	014000AMSL	01200AGL	USA
R3403A	FAA, INDIANAPOLIS ARTCC	Camp Atterbury	FL430	SURFACE	USA
R3403B	FAA, INDIANAPOLIS ARTCC	Camp Atterbury	FL180	01200AGL	USA
R3404	FAA, HULMAN TWR, TERRE HAUTE	Naval Ammunitions Depot, Crane	004100AMSL	SURFACE	USN
R3405	FAA, HULMAN TWR, TERRE HAUTE	Naval Ammunitions Depot, Crane	001600AMSL	SURFACE	USN
R3601A	FAA, KANSAS CITY ARTCC	Smoky Hill	FL180	SURFACE	USAF(ANG)
R3601B	FAA, KANSAS CITY ARTCC	Smoky Hill	FL230	FL180	USAF(ANG)
R3602A	FAA, KANSAS CITY ARTCC	Fort Riley	FL290	SURFACE	USA
R3602B	FAA, KANSAS CITY ARTCC	Fort Riley	FL290	SURFACE	USA
R3701A	USA, CAMPBELL AAF APP	Fort Campbell	005000AMSL	SURFACE	USA
R3702A	FAA, MEMPHIS ARTCC	Fort Campbell	010000AMSL	SURFACE	USA
R3702B	FAA, MEMPHIS ARTCC	Fort Campbell	FL220	10000AMSL	USA
R3702C	FAA, MEMPHIS ARTCC	Fort Campbell	FL270	FL220	USA
R3704A	FAA, STANDIFORD TWR, LOUISVILLE	Fort Knox	010000AMSL	SURFACE	USA
R3704B	FAA, INDIANAPOLIS ARTCC	Fort Knox	FL200	10001AMSL	USA
R3801A	FAA, HOUSTON ARTCC	Barksdale AFB	010000AMSL	SURFACE	USAF
R3801B	FAA, HOUSTON ARTCC	Barksdale AFB	FL180	10000AMSL	USAF
R3801C	FAA, HOUSTON ARTCC	Barksdale AFB	FL230	FL180	USAF
R3803A	FAA, HOUSTON ARTCC	Fort Polk	FL180	SURFACE	USA
R3803B	FAA, HOUSTON ARTCC	Fort Polk	034999AMSL	FL180	USA
R3804A	FAA, HOUSTON ARTCC	Fort Polk	FL180	SURFACE	USA
R3804B	FAA, HOUSTON ARTCC	Fort Polk	009999AMSL	SURFACE	USA
R3804C	FAA, HOUSTON ARTCC	Fort Polk	FL350	FL180	USA
R4001A(A)	FAA, WASHINGTON, DC ARTCC	Aberdeen Proving Ground	UNLTD	SURFACE	USA
R4001A(B)	FAA, WASHINGTON, DC ARTCC	Aberdeen Proving Ground	UNLTD	10001AMSL	USA
R4001B	FAA, WASHINGTON, DC ARTCC	Aberdeen Proving Ground	010000AMSL	SURFACE	USA
R4001C	FAA, WASHINGTON, DC ARTCC	Aberdeen Proving Ground	010000AMSL	SURFACE	USA
R4002	FAA, WASHINGTON, DC ARTCC	Patuxent River Complex	FL200	SURFACE	USN

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
R4005 (A)	FAA, WASHINGTON, DC ARTCC	Patuxent River Complex	024999AMSL	SURFACE	USN
R4005 (B)	FAA, WASHINGTON, DC ARTCC	Patuxent River Complex	024999AMSL	SURFACE	USN
R4005 (C)	FAA, WASHINGTON, DC ARTCC	Patuxent River Complex	024999AMSL	SURFACE	USN
R4005 (D)	FAA, WASHINGTON, DC ARTCC	Patuxent River Complex	024999AMSL	SURFACE	USN
R4006	FAA, WASHINGTON, DC ARTCC	Patuxent River Complex	024999AMSL	03500AMSL	USN
R4007	FAA, WASHINGTON, DC ARTCC	Patuxent River Complex	004999AMSL	SURFACE	USN
R4008	FAA, WASHINGTON, DC ARTCC	Patuxent River Complex	FL850	FL250	USN
R4009	FAA, WASHINGTON, DC ARTCC	FAA, WASHINGTON, DC ARTCC	012500AMSL	05000AMSL	USN
R4101	FAA, CAPE APP	Camp Edwards	009000AMSL	SURFACE	USA
R4102A	FAA, BOSTON ARTCC	Devens Reserve Forces Training Area	001999AMSL	SURFACE	USA
R4102B	FAA, BOSTON ARTCC	Devens Reserve Forces Training Area	003995AMSL	02000AMSL	USA
R4201A	FAA, MINNEAPOLIS ARTCC	Camp Grayling	FL230	SURFACE	USA
R4201B	FAA, MINNEAPOLIS ARTCC	Camp Grayling	009000AMSL	SURFACE	USA
R4202	FAA, MINNEAPOLIS ARTCC	Camp Grayling	008200AMSL	SURFACE	USA
R4207	FAA, MINNEAPOLIS ARTCC	Phelps-Collins ANGB	FL450	SURFACE	USAF(ANG)
R4301	FAA, MINNEAPOLIS ARTCC	Camp Ripley	FL270	SURFACE	USA
R4305	FAA, MINNEAPOLIS ARTCC	Offutt AFB	FL450	SURFACE	USAF
R4401A	FAA, HOUSTON ARTCC	Camp Shelby	004000AMSL	SURFACE	USA(ARNG)
R4401B	FAA, HOUSTON ARTCC	Camp Shelby	010000AMSL	04000AMSL	USA(ARNG)
R4401C	FAA, HOUSTON ARTCC	Camp Shelby	FL180	10000AMSL	USA(ARNG)
R4401D	FAA, HOUSTON ARTCC	Camp Shelby	FL230	FL180	USA(ARNG)
R4401E	FAA, HOUSTON ARTCC	Camp Shelby	FL290	FL230	USA(ARNG)
R4404A	FAA, MEMPHIS ARTCC	Meridian Complex	011500AMSL	SURFACE	USN
R4404B	FAA, MEMPHIS ARTCC	Meridian Complex	011500AMSL	01200AGL	USN
R4404C	FAA, MEMPHIS ARTCC	Meridian Complex	014500AMSL	11500AMSL	USN
R4501A	FAA, KANSAS CITY ARTCC	Fort Leonard Wood	002199AMSL	SURFACE	USA
R4501B	FAA, KANSAS CITY ARTCC	Fort Leonard Wood	004300AMSL	SURFACE	USA(ARNG)
R4501C	FAA, KANSAS CITY ARTCC	Fort Leonard Wood	005000AMSL	02200AMSL	USA
R4501D	FAA, KANSAS CITY ARTCC	Fort Leonard Wood	012000AMSL	05000AMSL	USA
R4501E	FAA, KANSAS CITY ARTCC	Fort Leonard Wood	FL180	12000AMSL	USA
R4501F	FAA, KANSAS CITY ARTCC	Fort Leonard Wood	003200AMSL	SURFACE	USA
R4501H	FAA, KANSAS CITY ARTCC	Fort Leonard Wood	003200AMSL	SURFACE	USA
R4803	FAA, OAKLAND ARTCC	Fallon Range Complex	018000AMSL	SURFACE	USN
R4804A	FAA, OAKLAND ARTCC	Fallon Range Complex	018000AMSL	SURFACE	USN

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
R4804B	FAA, OAKLAND ARTCC	Fallon Range Complex	FL350	FL180	USN
R4806E	FAA, LOS ANGELES ARTCC	Nellis AFB	UNLTD	00100AGL	USAF
R4806W	FAA, LOS ANGELES ARTCC	Nellis AFB	UNLTD	SURFACE	USAF
R4807A	FAA, LOS ANGELES ARTCC	Nellis AFB	UNLTD	SURFACE	USAF
R4807B	FAA, LOS ANGELES ARTCC	Nellis AFB	UNLTD	SURFACE	USAF
R4808N	FAA, LOS ANGELES ARTCC	Nellis AFB	UNLTD	SURFACE	DOE
R4808S	FAA, LOS ANGELES ARTCC	Nellis AFB	UNLTD	SURFACE	DOE
R4809	FAA, LOS ANGELES ARTCC	Nellis AFB	UNLTD	SURFACE	DOE
R4810	FAA, OAKLAND ARTCC	Fallon Range Complex	017000AMSL	SURFACE	USN
R4811	FAA, OAKLAND ARTCC	Hawthorne Army Ammunition Plant	015000AMSL	SURFACE	USA
R4812	FAA, OAKLAND ARTCC	Fallon Range Complex	018000AMSL	SURFACE	USN
R4813A	FAA, OAKLAND ARTCC	Fallon Range Complex	018000AMSL	SURFACE	USN
R4813B	FAA, OAKLAND ARTCC	Fallon Range Complex	FL350	FL180	USN
R4816N	FAA, OAKLAND ARTCC	Fallon Range Complex	018000AMSL	01500AGL	USN
R4816S	FAA, OAKLAND ARTCC	Fallon Range Complex	018000AMSL	00500AGL	USN
R5001A	U S AIR FORCE, MCGUIRE TRACON	Fort Dix	004000AMSL	SURFACE	USA
R5001B	U S AIR FORCE, MCGUIRE TRACON	Fort Dix	008000AMSL	04000AMSL	USA
R5002A	FAA, NEW YORK ARTCC	McGuire AFB	014000AMSL	SURFACE	USAF(ANG)
R5002B	FAA, NEW YORK ARTCC	McGuire AFB	014000AMSL	01000AMSL	USAF(ANG)
R5002C	FAA, NEW YORK ARTCC	McGuire AFB	003000AMSL	SURFACE	USAF(ANG)
R5002D	FAA, NEW YORK ARTCC	McGuire AFB	004000AMSL	SURFACE	USAF(ANG)
R5002E	FAA, NEW YORK ARTCC	McGuire AFB	014000AMSL	03500AMSL	USAF(ANG)
R5002F	FAA, NEW YORK ARTCC	McGuire AFB	FL200	14000AMSL	USAF(ANG)
R5103(D)	FAA, ALBUQUERQUE ARTCC	Fort Bliss	UNLTD	01501AGL	USA
R5103(E)	FAA, ALBUQUERQUE ARTCC	Fort Bliss	UNLTD	01501AGL	USA
R5103A	FAA, ALBUQUERQUE ARTCC	Fort Bliss	017999AMSL	SURFACE	USA
R5103B	FAA, ALBUQUERQUE ARTCC	Fort Bliss	UNLTD	SURFACE	USA
R5103C	FAA, ALBUQUERQUE ARTCC	Fort Bliss	UNLTD	SURFACE	USA
R5104A	FAA, ALBUQUERQUE ARTCC	Cannon AFB	017999AMSL	SURFACE	USAF
R5104B	FAA, ALBUQUERQUE ARTCC	Cannon AFB	023000AMSL	18000AMSL	USAF
R5105	FAA, ALBUQUERQUE ARTCC	Cannon AFB	010000AMSL	SURFACE	USAF
R5107A	FAA, ALBUQUERQUE ARTCC	Fort Bliss	UNLTD	SURFACE	USA
R5107B	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	UNLTD	SURFACE	USA
R5107C	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	UNLTD	09000AMSL	USA

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
R5107D	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	022000AMSL	SURFACE	USA
R5107E	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	UNLTD	SURFACE	USA
R5107F	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	FL450	FL240	USA
R5107G	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	FL450	FL240	USA
R5107H	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	009000AMSL	SURFACE	USA
R5107J	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	009000AMSL	SURFACE	USA
R5107K	ALBUQUERQUE CENTER	Camp Atterbury	UNLTD	SURFACE	USA
R5109A	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	UNLTD	24000AMSL	USA
R5109B	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	UNLTD	24000AMSL	USA
R5111A	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	UNLTD	13000AMSL	USA
R5111B	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	013000AMSL	SURFACE	USA
R5111C	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	UNLTD	13000AMSL	USA
R5111D	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	012999AMSL	SURFACE	USA
R5113	FAA, ALBUQUERQUE ARTCC	Office of Naval Research, Atmospheric Sciences	FL450	SURFACE	USN
R5115	FAA, ALBUQUERQUE ARTCC	McChord AFB	015000AMSL	SURFACE	USAF
R5117	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	UNLTD	SURFACE	USA
R5119	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	UNLTD	FL350	USA
R5121	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	UNLTD	FL200	USA
R5123	FAA, ALBUQUERQUE ARTCC	White Sands Missile Range	UNLTD	SURFACE	USA
R5201	FAA, BOSTON ARTCC	Fort Drum	023000AMSL	SURFACE	USA
R5202A	FAA, BOSTON ARTCC	174 FW, NY ANG	FL290	FL230	USAF(ANG)
R5202B	FAA, BOSTON ARTCC	174 FW, NY ANG	FL290	06000AMSL	USAF(ANG)
R5206	FAA, NEW YORK APP	West Point	005000AMSL	SURFACE	USA
R5301	FAA, WASHINGTON ARTCC	VACAPES Range Complex	014000AMSL	SURFACE	USN
R5302A	USMC, MCAS CHERRY POINT APCH CTL	VACAPES Range Complex	014000AMSL	SURFACE	USN
R5302B	USMC, MCAS CHERRY POINT APCH CTL	VACAPES Range Complex	014000AMSL	00100AGL	USN
R5302C	USMC, MCAS CHERRY POINT APCH CTL	VACAPES Range Complex	003000AMSL	00100AGL	USN
R5303A	USMC, CHERRY POINT APP	Cherry Point/Camp Lejeune Range Complex	006999AMSL	SURFACE	USMC
R5303B	USMC, CHERRY POINT APP	Cherry Point/Camp Lejeune Range Complex	009999AMSL	07000AMSL	USMC

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
R5303C	FAA, WASHINGTON, DC ARTCC	Cherry Point/Camp Lejeune Range Complex	018000AMSL	10000AMSL	USMC
R5304A	USMC, CHERRY POINT APP	Cherry Point/Camp Lejeune Range Complex	006999AMSL	SURFACE	USMC
R5304B	USMC, CHERRY POINT APP	Cherry Point/Camp Lejeune Range Complex	009999AMSL	07000AMSL	USMC
R5304C	FAA, WASHINGTON, DC ARTCC	Cherry Point/Camp Lejeune Range Complex	018000AMSL	10000AMSL	USMC
R5306A	USMC, CHERRY POINT APP	Cherry Point/Camp Lejeune Range Complex	018000AMSL	SURFACE	USMC
R5306C	USMC, CHERRY POINT APP	Cherry Point/Camp Lejeune Range Complex	018000AMSL	01200AMSL	USMC
R5306D	USMC, CHERRY POINT APP	Cherry Point/Camp Lejeune Range Complex	018000AMSL	SURFACE	USMC
R5306E	USMC, CHERRY POINT APP	Cherry Point/Camp Lejeune Range Complex	018000AMSL	SURFACE	USMC
R5311A	FAA, WASHINGTON, DC ARTCC	Fort Bragg	006999AMSL	SURFACE	USA
R5311B	FAA, WASHINGTON, DC ARTCC	Fort Bragg	011999AMSL	07000AMSL	USA
R5311C	FAA, WASHINGTON, DC ARTCC	Fort Bragg	028999AMSL	12000AMSL	USA
R5313A	USMC, MCAS CHERRY POINT APCH CTL	VACAPES Range Complex	018000AMSL	SURFACE	USN
R5313B	USMC, MCAS CHERRY POINT APCH CTL	VACAPES Range Complex	013000AMSL	00100AGL	USN
R5313C	USMC, MCAS CHERRY POINT APCH CTL	VACAPES Range Complex	013000AMSL	00100AGL	USN
R5313D	USMC, MCAS CHERRY POINT APCH CTL	VACAPES Range Complex	013000AMSL	00500AGL	USN
R5314A	USMC, MCAS CHERRY POINT APCH CTL	VACAPES Range Complex	FL205	SURFACE	USAF
R5314B	USMC, MCAS CHERRY POINT APCH CTL	VACAPES Range Complex	FL205	00500AGL	USAF
R5314C	USMC, MCAS CHERRY POINT APCH CTL	VACAPES Range Complex	015000AMSL	00200AGL	USAF
R5314D	USMC, MCAS CHERRY POINT APCH CTL	VACAPES Range Complex	FL205	SURFACE	USAF
R5314E	USMC, MCAS CHERRY POINT APCH CTL	VACAPES Range Complex	FL205	00500AGL	USAF

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
R5314F	USMC, MCAS CHERRY POINT APCH CTL	VACAPES Range Complex	015000AMSL	00200AGL	USAF
R5314H	USMC, MCAS CHERRY POINT APCH CTL	VACAPES Range Complex	010000AMSL	00500AGL	USAF
R5314J	USMC, MCAS CHERRY POINT APCH CTL	VACAPES Range Complex	006000AMSL	01000AGL	USAF
R5401	FAA, MINNEAPOLIS ARTCC	Camp Grafton	005000AMSL	SURFACE	USA(ARNG)
R5402	FAA, MINNEAPOLIS ARTCC	Camp Grafton	009999AMSL	00500AGL	USA(ARNG)
R5403A	FAA, MINNEAPOLIS ARTCC	Camp Grafton	009999AMSL	08000AMSL	USA(ARNG)
R5403B	FAA, MINNEAPOLIS ARTCC	Camp Grafton	013999AMSL	10000AMSL	USA(ARNG)
R5403C	FAA, MINNEAPOLIS ARTCC	Camp Grafton	017999AMSL	14000AMSL	USA(ARNG)
R5403D	FAA, MINNEAPOLIS ARTCC	Camp Grafton	011999AMSL	10000AMSL	USA(ARNG)
R5403E	FAA, MINNEAPOLIS ARTCC	Camp Grafton	013999AMSL	12000AMSL	USA(ARNG)
R5403F	FAA, MINNEAPOLIS ARTCC	Camp Grafton	017999AMSL	14000AMSL	USA(ARNG)
R5502A	FAA, CLEVELAND ARTCC	Camp Perry	005000AMSL	SURFACE	USA(ARNG)
R5502B	FAA, CLEVELAND ARTCC	Camp Perry	FL230	SURFACE	USA(ARNG)
R5601A	FAA, FORT WORTH ARTCC	Fort Sill	FL400	SURFACE	USA
R5601B	FAA, FORT WORTH ARTCC	Fort Sill	FL400	SURFACE	USA
R5601C	FAA, FORT WORTH ARTCC	Fort Sill	FL400	SURFACE	USA
R5601D	FAA, FORT WORTH ARTCC	Fort Sill	FL400	00500AGL	USA
R5601E	FAA, FORT WORTH ARTCC	Fort Sill	006000AMSL	00500AGL	USA
R5601F(A)	FAA, FORT WORTH ARTCC	Fort Sill	FL400	00500AGL	USA
R5601F(B)	FAA, FORT WORTH ARTCC	Fort Sill	FL400	05500AMSL	USA
R5601F(C)	FAA, FORT WORTH ARTCC	Fort Sill	FL400	00500AGL	USA
R5601F(D)	FAA, FORT WORTH ARTCC	Fort Sill	FL400	03500AMSL	USA
R5701(A)	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	FL200	SURFACE	USN
R5701(B)	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	010000AMSL	SURFACE	USN
R5701(C)	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	006000AMSL	SURFACE	USN
R5701(D)	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	010000AMSL	SURFACE	USN
R5701(E)	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	006000AMSL	SURFACE	USN
R5706	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	010000AMSL	03500AMSL	USN
R5801	FAA, WASHINGTON, DC ARTCC	Letterkenny Ordnance Depot	004000AMSL	SURFACE	USA
R5802A	FAA, NEW YORK ARTCC	Fort Indiantown Gap	005000AMSL	00200AGL	USA
R5802B	FAA, NEW YORK ARTCC	Fort Indiantown Gap	013000AMSL	SURFACE	USA

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
R5802C	FAA, NEW YORK ARTCC	Fort Indiantown Gap	016999AMSL	00500AGL	USA
R5802D	FAA, NEW YORK ARTCC	Fort Indiantown Gap	021999AMSL	17000AMSL	USA
R5802E	FAA, NEW YORK ARTCC	Fort Indiantown Gap	FL250	FL220	USA
R5803	FAA, WASHINGTON, DC ARTCC	Letterkenny Ordnance Depot	004000AMSL	SURFACE	USA
R6001A	FAA, JACKSONVILLE ARTCC	Fort Jackson	003200AMSL	SURFACE	USA
R6001B	FAA, JACKSONVILLE ARTCC	Fort Jackson	FL230	03200AMSL	USA
R6002A	FAA, JACKSONVILLE ARTCC	Shaw AFB	012999AMSL	SURFACE	USAF
R6002B	FAA, JACKSONVILLE ARTCC	Shaw AFB	018000AMSL	13000AMSL	USAF
R6002C	FAA, JACKSONVILLE ARTCC	Shaw AFB	FL230	FL180	USAF
R6302A	FAA, HOUSTON ARTCC	Fort Hood	FL300	SURFACE	USA
R6302B	FAA, HOUSTON ARTCC	Fort Hood	011000AMSL	SURFACE	USA
R6302C	FAA, HOUSTON ARTCC	Fort Hood	FL300	SURFACE	USA
R6302D	FAA, HOUSTON ARTCC	Fort Hood	FL300	SURFACE	USA
R6302E	FAA, HOUSTON ARTCC	Fort Hood	FL450	FL300	USA
R6312(A)	FAA, HOUSTON ARTCC	GOMEX Range Complex	023000AMSL	01000AGL	USN
R6312(B)	FAA, HOUSTON ARTCC	GOMEX Range Complex	023000AMSL	SURFACE	USN
R6312(C)	FAA, HOUSTON ARTCC	GOMEX Range Complex	023000AMSL	SURFACE	USN
R6316	FAA, HOUSTON ARTCC	McChord AFB	015000AMSL	SURFACE	USAF
R6317	FAA, HOUSTON ARTCC	McChord AFB	015000AMSL	SURFACE	USAF
R6318	FAA, ALBUQUERQUE ARTCC	McChord AFB	014000AMSL	SURFACE	USAF
R6402A	FAA, SALT LAKE CITY ARTCC	Hill AFB	FL580	SURFACE	USAF
R6402B	FAA, SALT LAKE CITY ARTCC	Hill AFB	FL580	00100AGL	USAF
R6403	FAA, SALT LAKE CITY ARTCC	Tooele Army Depot	009000AMSL	SURFACE	USA
R6404A	FAA, SALT LAKE CITY ARTCC	Hill AFB	FL580	SURFACE	USAF
R6404B	FAA, SALT LAKE CITY ARTCC	Hill AFB	013000AMSL	SURFACE	USAF
R6404C	FAA, SALT LAKE CITY ARTCC	Hill AFB	FL280	00100AGL	USAF
R6404D	FAA, SALT LAKE CITY ARTCC	Hill AFB	FL250	13000AMSL	USAF
R6405	FAA, SALT LAKE CITY ARTCC	Hill AFB	FL580	00100AGL	USAF
R6406A	FAA, SALT LAKE CITY ARTCC	Hill AFB	FL580	SURFACE	USAF
R6406B	FAA, SALT LAKE CITY ARTCC	Hill AFB	FL580	00100AGL	USAF
R6407	FAA, SALT LAKE CITY ARTCC	Hill AFB	FL580	SURFACE	USAF
R6412A	FAA, SALT LAKE CITY TRACON	Camp Williams	009000AMSL	SURFACE	USA(ARNG)
R6412B	FAA, SALT LAKE CITY TRACON	Camp Williams	010000AMSL	09000AMSL	USA(ARNG)
R6412C	FAA, SALT LAKE CITY TRACON	Camp Williams	009000AMSL	SURFACE	USA(ARNG)

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
R6412D	FAA, SALT LAKE CITY TRACON	Camp Williams	010000AMSL	09000AMSL	USA(ARNG)
R6413	FAA, DENVER ARTCC	White Sands Missile Range	UNLTD	SURFACE	USAF
R6501A	FAA, BURLINGTON APP	Camp Ethan Allen	004000AMSL	SURFACE	USA(ARNG)
R6501B	FAA, BURLINGTON APP	Camp Ethan Allen	013600AMSL	04000AMSL	USA(ARNG)
R6601A	FAA, POTOMAC TRACON	Fort A.P. Hill	004500AMSL	SURFACE	USA
R6601B	FAA, POTOMAC TRACON	Fort A.P. Hill	007500AMSL	04500AMSL	USA
R6601C	FAA, POTOMAC TRACON	Fort A.P. Hill	009000AMSL	07500AMSL	USA
R6602A	FAA, WASHINGTON, DC ARTCC	Fort Lee	003999AMSL	SURFACE	USA
R6602B	FAA, WASHINGTON, DC ARTCC	Fort Lee	010999AMSL	04000AMSL	USA
R6602C	FAA, WASHINGTON, DC ARTCC	Fort Lee	018000AMSL	11000AMSL	USA
R6606	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	FL510	SURFACE	USN
R6608A	FAA, DULLES INTL TWR	Quantico Range Complex	010000AMSL	SURFACE	USMC
R6608B	FAA, DULLES INTL TWR	Quantico Range Complex	010000AMSL	SURFACE	USMC
R6608C	FAA, DULLES INTL TWR	Quantico Range Complex	010000AMSL	SURFACE	USMC
R6609	FAA, WASHINGTON, DC ARTCC	Patuxent River Complex	FL200	SURFACE	USN
R6611A	FAA, WASHINGTON, DC ARTCC	NSWC Dahlgren	FL400	SURFACE	USN
R6611B	FAA, WASHINGTON, DC ARTCC	NSWC Dahlgren	FL600	FL400	USN
R6612	FAA, WASHINGTON, DC ARTCC	NSWC Dahlgren	007000AMSL	SURFACE	USN
R6613A	FAA, WASHINGTON, DC ARTCC	NSWC Dahlgren	FL400	SURFACE	USN
R6613B	FAA, WASHINGTON, DC ARTCC	NSWC Dahlgren	FL600	FL400	USN
R6701	USN, WHIDBEY ISLAND NAS APP	Whidbey Island Range Complex	005000AMSL	SURFACE	USN
R6703A	FAA, SEATTLE-TACOMA APP	Whidbey Island Range Complex	014000AMSL	SURFACE	USN
R6703B	FAA, SEATTLE-TACOMA APP	Whidbey Island Range Complex	014000AMSL	SURFACE	USN
R6703C	FAA, SEATTLE TRACON	Whidbey Island Range Complex	014000AMSL	SURFACE	USN
R6703D	FAA, SEATTLE TRACON	Whidbey Island Range Complex	014000AMSL	SURFACE	USN
R6703E	FAA, SEATTLE-TACOMA APP	Whidbey Island Range Complex	014000AMSL	SURFACE	USN
R6703F	FAA, SEATTLE-TACOMA APP	Whidbey Island Range Complex	005000AMSL	SURFACE	USN
R6703G	FAA, SEATTLE-TACOMA APP	Whidbey Island Range Complex	005000AMSL	SURFACE	USN
R6703H	FAA, SEATTLE-TACOMA APP	Whidbey Island Range Complex	005000AMSL	SURFACE	USN
R6703I	FAA, SEATTLE-TACOMA APP	Whidbey Island Range Complex	005000AMSL	SURFACE	USN
R6703J	FAA, SEATTLE-TACOMA APP	Whidbey Island Range Complex	005000AMSL	SURFACE	USN
R6714A	FAA, SEATTLE ARTCC	Fort Lewis	028999AMSL	SURFACE	USA
R6714B	FAA, SEATTLE ARTCC	Fort Lewis	028999AMSL	SURFACE	USA
R6714C	FAA, SEATTLE ARTCC	Fort Lewis	028999AMSL	SURFACE	USA

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
R6714D	FAA, SEATTLE ARTCC	Fort Lewis	028999AMSL	SURFACE	USA
R6714E	FAA, SEATTLE ARTCC	Yakima	054999AMSL	29000AMSL	USA
R6714F	FAA, SEATTLE ARTCC	Fort Lewis	028999AMSL	SURFACE	USA
R6714G	FAA, SEATTLE ARTCC	Fort Lewis	028999AMSL	SURFACE	USA
R6714H	FAA, SEATTLE ARTCC	Fort Lewis	005499AMSL	SURFACE	USA
R6901A	FAA, MINNEAPOLIS ARTCC	Fort McCoy	FL200	SURFACE	USA
R6901B	FAA, MINNEAPOLIS ARTCC	Fort McCoy	FL200	SURFACE	USA
R6903	FAA, MINNEAPOLIS ARTCC	Volk Field ANGB	FL450	SURFACE	USAF(ANG)
R6904A	FAA, MINNEAPOLIS ARTCC	Volk Field ANGB	FL230	00150AGL	USAF(ANG)
R6904B	FAA, MINNEAPOLIS ARTCC	Volk Field ANGB	FL230	SURFACE	USAF(ANG)
R7001A	FAA, DENVER ARTCC	Camp Guernsey	007999AMSL	SURFACE	USA
R7001B	FAA, DENVER ARTCC	Camp Guernsey	023500AMSL	08000AMSL	USA
R7001C	FAA, DENVER ARTCC	Camp Guernsey	FL300	23500AMSL	USA
RACER A MOA, IN	FAA, INDIANAOPPLIS ARTCC	Camp Atterbury	004000AMSL	00500AGL	USAF(ANG)
RACER B MOA, IN	FAA, INDIANAOPPLIS ARTCC	Camp Atterbury	008000AMSL	04000AMSL	USAF(ANG)
RACER C MOA, IN	FAA, INDIANAOPPLIS ARTCC	Camp Atterbury	018000AMSL	00500AGL	USAF(ANG)
RACER D MOA, IN	FAA, INDIANAOPPLIS ARTCC	Camp Atterbury	018000AMSL	14000AMSL	USAF(ANG)
RAINIER 1 MOA, WA	FAA, SEATTLE-TRACON	Fort Lewis	009000AMSL	02000AMSL	USA
RAINIER 2 MOA, WA	FAA, SEATTLE TRACON	Fort Lewis	009000AMSL	02000AMSL	USA
RAINIER 3 MOA, WA	FAA, SEATTLE TRACON	Fort Lewis	009000AMSL	02000AMSL	USA
RANCH HIGH MOA, NV	FAA, OAKLAND ARTCC	Fallon Range Complex	013000AMSL	09000AMSL	USN
RANCH LOW MOA, NV	FAA, OAKLAND ARTCC	Fallon Range Complex	009000AMSL	00500AGL	USN
RANDOLPH 1A MOA, TX	FAA, HOUSTON ARTCC	Randolph AFB	018000AMSL	08000AMSL	USAF
RANDOLPH 1B MOA, TX	FAA, SAN ANTONIO TRACON	Randolph AFB	018000AMSL	07000AMSL	USAF
RANDOLPH 2A MOA, TX	FAA, HOUSTON ARTCC	Randolph AFB	018000AMSL	09000AMSL	USAF
RANDOLPH 2B MOA, TX	FAA, HOUSTON ARTCC	Randolph AFB	018000AMSL	14000AMSL	USAF
RED HILLS MOA, IN	FAA, INDIANAPOLIS ARTCC	181 TFG, IN ANG, Terre Haute	018000AMSL	06000AMSL	USAF(ANG)
RENO MOA, NV	FAA, OAKLAND ARTCC	Fallon Range Complex	018000AMSL	13000AMSL	USN
RESERVE MOA, AZ	FAA, ALBUQUERQUE ARTCC	162 FW, AZ ANG	018000AMSL	05000AGL	USAF(ANG)
REVEILLE NORTH MOA, NV	FAA, SALT LAKE CITY ARTCC	Nellis AFB	018000AMSL	00100AGL	USAF
REVEILLE SOUTH MOA, NV	FAA, SALT LAKE CITY ARTCC	Nellis AFB	018000AMSL	00100AGL	USAF
RILEY MOA, KS	FAA, KANSAS CITY ARTCC	Fort Riley	FL180	07000AMSL	USA
RIVERS MOA, OK	FAA, FORT WORTH ARTCC	125th FS, OK ANG	018000AMSL	08000AMSL	USAF(ANG)

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
ROBERTS MOA, CA	FAA, OAKLAND ARTCC	Whidbey Island Range Complex	014999AMSL	00500AGL	USN
ROOSEVELT A MOA, WA	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	018000AMSL	09000AMSL	USN
ROOSEVELT B MOA, WA	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	008999AMSL	00300AGL	USN
ROOSEVELT B MOA, WA (XA)	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	008999AMSL	01501AGL	USN
ROSE HILL MOA, AL	FAA, JACKSONVILLE ARTCC	Eglin AFB	017999AMSL	08000AMSL	USAF
RUBY 1 MOA, AZ	FAA, ALBUQUERQUE ARTCC	162 FW, AZ ANG	018000AMSL	10000AMSL	USAF(ANG)
SADDLE A MOA, OR	FAA, SALT LAKE CITY ARTCC	Mt. Home AFB	018000AMSL	10000AMSL	USAF
SADDLE B MOA, OR	FAA, SALT LAKE CITY ARTCC	Mt. Home AFB	018000AMSL	08000AMSL	USAF
SALEM MOA, (XA) MO	FAA, KANSAS CITY ARTCC	131 TFW, Det 1, MO ANG	001500AGL	SURFACE	USAF(ANG)
SALEM MOA, (XB) MO	FAA, KANSAS CITY ARTCC	131 TFW, Det 1, MO ANG	001500AGL	SURFACE	USAF(ANG)
SALEM MOA, MO	FAA, KANSAS CITY ARTCC	131 TFW, Det 1, MO ANG	006999AMSL	SURFACE	USAF(ANG)
SALINE MOA, (XA) CA	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	Edwards AFB	003000AMSL	SURFACE	USAF
SALINE MOA, CA	FAA, JOSHUA CONTROL FAC, EDWARDS AFB	Edwards AFB	018000AMSL	00200AGL	USAF
SELLS 1 MOA, AZ	FAA, ALBUQUERQUE ARTCC	Luke AFB	018000AMSL	10000AMSL	USAF
SELLS LOW MOA, AZ	FAA, ALBUQUERQUE ARTCC	Luke AFB	009999AMSL	03000AGL	USAF
SEVIER A MOA, UT	FAA, SALT LAKE CITY ARTCC	Hill AFB	014500AMSL	00100AGL	USAF
SEVIER B MOA, UT	FAA, SALT LAKE CITY ARTCC	Hill AFB	009500AMSL	00100AGL	USAF
SEVIER C MOA, NV	FAA, SALT LAKE CITY ARTCC	Hill AFB	018000AMSL	14500AMSL	USAF
SEVIER D MOA, UT	FAA, SALT LAKE CITY ARTCC	Hill AFB	018000AMSL	09500AMSL	USAF
SEYMOUR JOHNSON ECHO MOA, NC	FAA, WASHINGTON, DC ARTCC	Seymour-Johnson AFB	018000AMSL	07000AMSL	USAF
SHEPPARD 1 MOA, TX	FAA, FORT WORTH ARTCC	Sheppard AFB	018000AMSL	08000AMSL	USAF
SHEPPARD 2 MOA, TX	FAA, FORT WORTH ARTCC	Sheppard AFB	018000AMSL	08000AMSL	USAF
SHIRLEY A MOA, AR	FAA, MEMPHIS ARTCC	Fort Smith	018000AMSL	11000AMSL	USAF
SHIRLEY B MOA, AR	FAA, MEMPHIS ARTCC	Fort Smith	018000AMSL	11000AMSL	USAF
SHIRLEY C MOA, AR	FAA, MEMPHIS ARTCC	Fort Smith	018000AMSL	11000AMSL	USAF
SHOSHONE MOA, (XA) CA	FAA, LOS ANGELES ARTCC	R-2508 Complex	003000AGL	00200AGL	USAF
SHOSHONE MOA, (XB) CA	FAA, LOS ANGELES ARTCC	R-2508 Complex	001500AGL	SURFACE	USAF
SHOSHONE MOA, CA	FAA, LOS ANGELES ARTCC	R-2508 Complex	018000AMSL	03001AGL	USAF
SILVER NORTH MOA (XA), CA	FAA, LOS ANGELES ARTCC	Nellis AFB	003000AGL	SURFACE	USAF
SILVER NORTH MOA, CA	FAA, LOS ANGELES ARTCC	Nellis AFB	009000AMSL	00200AGL	USAF
SILVER SOUTH MOA, CA	FAA, LOS ANGELES ARTCC	Nellis AFB	007000AMSL	00200AGL	USAF

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
SMITTY MOA, (XA) NM	FAA, ALBUQUERQUE ARTCC	Kirtland AFB	002000AGL	SURFACE	USAF(ANG)
SMITTY MOA, (XB) NM	FAA, ALBUQUERQUE ARTCC	Kirtland AFB	002000AGL	SURFACE	USAF(ANG)
SMITTY MOA, (XC) NM	FAA, ALBUQUERQUE ARTCC	Kirtland AFB	001600AGL	SURFACE	USAF(ANG)
SMITTY MOA, NM	FAA, ALBUQUERQUE ARTCC	Kirtland AFB	013500AMSL	00500AGL	USAF(ANG)
SMOKY HIGH MOA, KS	FAA, KANSAS CITY ARTCC	Smoky Hill	FL180	05000AMSL	USAF(ANG)
SMOKY MOA, (XA) KS	FAA, KANSAS CITY ARTCC	Smoky Hill	001500AGL	SURFACE	USAF(ANG)
SMOKY MOA, KS	FAA, KANSAS CITY ARTCC	Smoky Hill	004999AMSL	00500AGL	USAF(ANG)
SNAKE LOW MOA, MS	FAA, HOUSTON ARTCC	CRTC Gulfport	006000AMSL	03000AMSL	USAF(ANG)
SNAKE MOA, MS	FAA, HOUSTON ARTCC	CRTC Gulfport	FL180	06000AMSL	USAF(ANG)
SNOOPY EAST MOA, (XA) MN	FAA, MINNEAPOLIS ARTCC	148 FIG, MN ANG	006000AMSL	SURFACE	USAF(ANG)
SNOOPY EAST MOA, MN	FAA, MINNEAPOLIS ARTCC	148 FIG, MN ANG	018000AMSL	00300AGL	USAF(ANG)
SNOOPY WEST MOA, MN	FAA, MINNEAPOLIS ARTCC	148 FIG, MN ANG	018000AMSL	06000AMSL	USAF(ANG)
SNOWBIRD MOA, TN	FAA, ATLANTA ARTCC	Seymour-Johnson AFB	018000AMSL	11000AMSL	USAF
STEELHEAD MOA, MI	FAA, MINNEAPOLIS ARTCC	Alpena CRTC	018000AMSL	06000AMSL	USAF
STONY A MOA, (XA) AK	FAA, ANCHORAGE ARTCC	Elmendorf AFB	001500AGL	SURFACE	USAF
STONY A MOA, AK	FAA, ANCHORAGE ARTCC	Elmendorf AFB	018000AMSL	00100AGL	USAF
STONY B MOA, (XA) AK	FAA, ANCHORAGE ARTCC	Elmendorf AFB	001500AGL	SURFACE	USAF
STONY B MOA, (XB) AK	FAA, ANCHORAGE ARTCC	Elmendorf AFB	001500AGL	SURFACE	USAF
STONY B MOA, (XC) AK	FAA, ANCHORAGE ARTCC	Elmendorf AFB	001500AGL	SURFACE	USAF
STONY B MOA, (XD) AK	FAA, ANCHORAGE ARTCC	Elmendorf AFB	001500AGL	SURFACE	USAF
STONY B MOA, AK	FAA, ANCHORAGE ARTCC	Elmendorf AFB	018000AMSL	02000AGL	USAF
STUMPY POINT MOA, NC	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	007999AMSL	SURFACE	USN
SUNDANCE MOA, (XA) CA	FAA, LOS ANGELES ARTCC	Twentynine Palms Range Complex	001500AGL	SURFACE	USMC
SUNDANCE MOA, CA	FAA, LOS ANGELES ARTCC	Twentynine Palms Range Complex	010000AMSL	00500AGL	USMC
SUNNY MOA, AZ	FAA, DENVER ARTCC	Luke AFB	018000AMSL	12000AMSL	USAF
SUSITNA MOA, AK	FAA, ANCHORAGE ARTCC	Elmendorf AFB	018000AMSL	10000AMSL	USAF
TAIBAN MOA, NM	FAA, ALBUQUERQUE ARTCC	Cannon AFB	010999AMSL	00500AGL	USAF
TALON EAST HIGH MOA, NM	FAA, ALBUQUERQUE ARTCC	Holloman AFB	018000AMSL	12500AMSL	USAF
TALON LOW MOA, NM	FAA, ALBUQUERQUE ARTCC	Holloman AFB	012499AMSL	00300AGL	USAF
TALON WEST HIGH MOA, NM	FAA, ALBUQUERQUE ARTCC	Holloman AFB	018000AMSL	12500AMSL	USAF
TEXON MOA, TX	FAA, HOUSTON ARTCC	Randolph AFB	018000AMSL	06000AMSL	USAF
TIGER NORTH MOA, (XA) ND	FAA, MINNEAPOLIS ARTCC	McChord AFB	003000AGL	SURFACE	USAF
TIGER NORTH MOA, (XB) ND	FAA, MINNEAPOLIS ARTCC	McChord AFB	001500AGL	SURFACE	USAF

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
TIGER NORTH MOA, (XC) ND	FAA, MINNEAPOLIS ARTCC	McChord AFB	001500AGL	SURFACE	USAF
TIGER NORTH MOA, (XD) ND	FAA, MINNEAPOLIS ARTCC	McChord AFB	001500AGL	SURFACE	USAF
TIGER NORTH MOA, ND	FAA, MINNEAPOLIS ARTCC	McChord AFB	018000AMSL	00300AGL	USAF
TIGER SOUTH MOA, ND	FAA, MINNEAPOLIS ARTCC	McChord AFB	018000AMSL	06000AMSL	USAF
TOMBSTONE A MOA, AZ	FAA, ALBUQUERQUE ARTCC	David-Monthan AFB	014499AMSL	00500AGL	USAF
TOMBSTONE B MOA, AZ	FAA, ALBUQUERQUE ARTCC	David-Monthan AFB	014499AMSL	00500AGL	USAF
TOMBSTONE C MOA, AZ	FAA, ALBUQUERQUE ARTCC	David-Monthan AFB	018000AMSL	14500AMSL	USAF
TORTUGAS MOA, FL	FAA, MIAMI ARTCC	Key West Range Complex	018000AMSL	05000AMSL	USN
TRUMAN A MOA, MO	FAA, KANSAS CITY ARTCC	Whiteman AFB	018000AMSL	08000AMSL	USAF
TRUMAN B MOA, MO	FAA, KANSAS CITY ARTCC	Whiteman AFB	018000AMSL	08000AMSL	USAF
TRUMAN C MOA, MO	FAA, KANSAS CITY ARTCC	Whiteman AFB	018000AMSL	00500AGL	USAF
TUPPER CENTRAL, NY	FAA, BOSTON ARTCC	174 FW, NY ANG	018000AMSL	08000AMSL	USAF(ANG)
TUPPER EAST, NY	FAA, BOSTON ARTCC	174 FW, NY ANG	018000AMSL	10000AMSL	USAF(ANG)
TUPPER SOUTH, NY	FAA, BOSTON ARTCC	174 FW, NY ANG	018000AMSL	08000AMSL	USAF(ANG)
TUPPER WEST, NY	FAA, BOSTON ARTCC	174 FW, NY ANG	018000AMSL	08000AMSL	USAF(ANG)
TURTLE MOA, AZ	FAA, LOS ANGELES ARTCC	Yuma Range Complex	018000AMSL	11000AMSL	USMC
TWELVE MILE EAST MOA, IN	FAA, CHICAGO ARTCC	122nd FW	009999AMSL	00500AGL	USAF(ANG)
TWELVE MILE WEST MOA, IN	FAA, CHICAGO ARTCC	122nd FW	005999AMSL	00500AGL	USAF(ANG)
TWO BUTTES HIGH MOA, CO	FAA, DENVER ARTCC	Buckley ANGB	018000AMSL	10000AMSL	USAF(ANG)
TWO BUTTES LOW MOA, CO	FAA, DENVER ARTCC	Buckley ANGB	009999AMSL	00300AGL	USAF(ANG)
TYNDALL B MOA, FL	USAF, TYNDALL RADAR APP CON	Tyndall AFB	018000AMSL	09000AMSL	USAF
TYNDALL C MOA, FL	USAF, TYNDALL RADAR APP CON	Tyndall AFB	006000AMSL	00300AGL	USAF
TYNDALL D MOA, FL	USAF, TYNDALL RADAR APP CON	Tyndall AFB	006000AMSL	00300AGL	USAF
TYNDALL E MOA, (XA) FL	USAF, TYNDALL RADAR APP CON	Tyndall AFB	001500AGL	SURFACE	USAF
TYNDALL E MOA, (XB) FL	USAF, TYNDALL RADAR APP CON	Tyndall AFB	001500AGL	SURFACE	USAF
TYNDALL E MOA, FL	USAF, TYNDALL RADAR APP CON	Tyndall AFB	018000AMSL	00300AGL	USAF
TYNDALL F MOA, (XA) FL	USAF, TYNDALL RADAR APP CON	Tyndall AFB	001500AGL	SURFACE	USAF
TYNDALL F MOA, (XB) FL	USAF, TYNDALL RADAR APP CON	Tyndall AFB	001500AGL	SURFACE	USAF
TYNDALL F MOA, FL	USAF, TYNDALL RADAR APP CON	Tyndall AFB	018000AMSL	00300AGL	USAF
TYNDALL G MOA, (XA) FL	USAF, TYNDALL RADAR APP CON	Tyndall AFB	001500AGL	SURFACE	USAF
TYNDALL G MOA, (XB) FL	USAF, TYNDALL RADAR APP CON	Tyndall AFB	001500AGL	SURFACE	USAF
TYNDALL G MOA, FL	USAF, TYNDALL RADAR APP CON	Tyndall AFB	018000AMSL	01000AGL	USAF
TYNDALL H MOA, FL	USAF, TYNDALL RADAR APP CON	Tyndall AFB	018000AMSL	09000AMSL	USAF
VALENTINE MOA, TX	FAA, ALBUQUERQUE ARTCC	Holloman AFB	018000AMSL	15000AMSL	USAF

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
VANCE 1A MOA, OK	FAA, KANSAS CITY ARTCC	Vance AFB	018000AMSL	08000AMSL	USAF
VANCE 1B MOA, OK	FAA, KANSAS CITY ARTCC	Vance AFB	018000AMSL	07000AMSL	USAF
VANCE 1C MOA, OK	FAA, KANSAS CITY ARTCC	Vance AFB	018000AMSL	08000AMSL	USAF
VANCE 1D MOA, OK	FAA, KANSAS CITY ARTCC	Vance AFB	018000AMSL	08000AMSL	USAF
VIPER A MOA, (XA) AK	FAA, FAIRBANKS TWR	Eielson AFB	005000AMSL	SURFACE	USAF
VIPER A MOA, (XB) AK	FAA, FAIRBANKS TWR	Eielson AFB	003000AMSL	SURFACE	USAF
VIPER A MOA, AK	FAA, FAIRBANKS TWR	Eielson AFB	010000AMSL	00500AGL	USAF
VIPER B MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	018000AMSL	10000AMSL	USAF
VOLK EAST MOA, WI	FAA, MINNEAPOLIS ARTCC	Volk Field ANGB	018000AMSL	08000AMSL	USAF(ANG)
VOLK SOUTH MOA, (XA) WI	FAA, MINNEAPOLIS ARTCC	Hardwood (Volk Field)	001500AGL	SURFACE	USAF(ANG)
VOLK SOUTH MOA, (XB) WI	FAA, MINNEAPOLIS ARTCC	Hardwood (Volk Field)	001500AGL	SURFACE	USAF(ANG)
VOLK SOUTH MOA, (XC) WI	FAA, MINNEAPOLIS ARTCC	Hardwood (Volk Field)	001500AGL	SURFACE	USAF(ANG)
VOLK SOUTH MOA, WI	FAA, MINNEAPOLIS ARTCC	Hardwood (Volk Field)	018000AMSL	00500AGL	USAF(ANG)
VOLK WEST MOA, WI	FAA, MINNEAPOLIS ARTCC	Volk Field ANGB	018000AMSL	00100AGL	USAF(ANG)
W102H	FAA, BOSTON ARTCC	Boston Range Complex	FL600	17001AMSL	USAF
W102L	FAA, BOSTON ARTCC	Boston Range Complex	017000AMSL	SURFACE	USAF
W103	FAA, BOSTON ARTCC	Boston Range Complex	002000AMSL	SURFACE	USAF
W104A	FAA, BOSTON ARTCC	Boston Range Complex	010000AMSL	SURFACE	USAF
W104B	FAA, BOSTON ARTCC	Boston Range Complex	018000AMSL	SURFACE	USAF
W104C	FAA, BOSTON ARTCC	Boston Range Complex	UNLTD	FL180	USAF
W105A	FAA, BOSTON ARTCC	Narragansett Range Complex	FL500	SURFACE	USN
W105B	FAA, BOSTON ARTCC	Narragansett Range Complex	FL180	SURFACE	USN
W106A	FAA, BOSTON ARTCC	Narragansett Range Complex	003000AMSL	SURFACE	USN
W106B	FAA, BOSTON ARTCC	Narragansett Range Complex	008000AMSL	SURFACE	USN
W106C	FAA, BOSTON ARTCC	Narragansett Range Complex	010000AMSL	SURFACE	USN
W106D	FACSFAC, VACAPES, OCEANA NAS	Narragansett Range Complex	005999AMSL	SURFACE	USN
W107A	FAA, WASHINGTON, DC ARTCC	Atlantic City Range Complex	UNLTD	SURFACE	USN
W107B	FAA, NEW YORK ARTCC	Atlantic City Range Complex	001999AMSL	SURFACE	USN
W107C	FAA, WASHINGTON, DC ARTCC	Atlantic City Range Complex	017999AMSL	SURFACE	USN
W110	USN, FACSFAC, VACAPES	VACAPES Range Complex	FL230	SURFACE	USN
W122(1)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(10)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(11)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(12)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
W122(13)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(14)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(15A)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(15B)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(16)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(17)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(18)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(19)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(2)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(20)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(21)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(22)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(23)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(3)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(4)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(5)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(6)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(7)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(8)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W122(9)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W135	FAA, JACKSONVILLE TRACON	Jacksonville Range Complex	001200AMSL	SURFACE	USN
W136B	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W136C	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W136E	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W136F	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W137A	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W137B	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W137C	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W137D	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W137E	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W137F	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W137G	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	013000AMSL	SURFACE	USN
W137L	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
W138A	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W138B	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W138C	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W138D	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W138E	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W138L	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W139A	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W139B	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W139C	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W139D	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W139E	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	SURFACE	USN
W139F	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	013000AMSL	SURFACE	USN
W140A	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	FL240	SURFACE	USN
W140B	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	FL240	SURFACE	USN
W140C	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	FL240	SURFACE	USN
W140D	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	FL240	SURFACE	USN
W140E	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	FL240	SURFACE	USN
W140F	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	013000AMSL	SURFACE	USN
W140H	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	UNLTD	FL430	USN
W141	FAA, JACKSONVILLE ARTCC	Jacksonville Range Complex	005000AMSL	SURFACE	USN
W147A	FAA, HOUSTON ARTCC	Ellington Field	022999AMSL	05000AMSL	USAF
W147B	FAA, HOUSTON ARTCC	Ellington Field	FL500	FL230	USAF
W147C	FAA, HOUSTON ARTCC	Ellington Field	FL500	SURFACE	USAF
W147D	FAA, HOUSTON ARTCC	Ellington Field	FL500	SURFACE	USAF
W147E	FAA, HOUSTON ARTCC	Ellington Field	FL500	FL260	USAF
W148A	FAA, HOUSTON ARTCC	CRTC Gulfport	006000AMSL	SURFACE	USAF(ANG)
W148B	FAA, HOUSTON ARTCC	CRTC Gulfport	FL600	06000AMSL	USAF(ANG)
W151A	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	SURFACE	USAF
W151B	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	SURFACE	USAF
W151C	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	SURFACE	USAF
W151D	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	SURFACE	USAF
W151E	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	SURFACE	USAF
W151F	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	SURFACE	USAF

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
W155A	FAA, JACKSONVILLE ARTCC	GOMEX Range Complex	FL600	SURFACE	USN
W155B	FAA, JACKSONVILLE ARTCC	GOMEX Range Complex	FL600	SURFACE	USN
W155C	FAA, JACKSONVILLE ARTCC	GOMEX Range Complex	FL600	SURFACE	USN
W161A	FAA, JACKSONVILLE ARTCC	Shaw AFB	FL620	SURFACE	USAF
W161B	FAA, JACKSONVILLE ARTCC	Shaw AFB	FL300	SURFACE	USAF
W168	FAA, MIAMI ARTCC	MacDill AFB	UNLTD	SURFACE	USAF
W174A	FAA, MIAMI ARTCC	Key West Range Complex	FL700	SURFACE	USN
W174B(A)	FAA, MIAMI ARTCC	Key West Range Complex	FL700	SURFACE	USN
W174B(B)	FAA, MIAMI ARTCC	Key West Range Complex	005500AMSL	SURFACE	USN
W174C(A)	FAA, MIAMI ARTCC	Key West Range Complex	FL700	SURFACE	USN
W174C(B)	FAA, MIAMI ARTCC	Key West Range Complex	005500AMSL	SURFACE	USN
W174D	FAA, MIAMI ARTCC	Key West Range Complex	FL700	SURFACE	USN
W174D(A)	FAA, MIAMI ARTCC	Key West Range Complex	FL700	05500AMSL	USN
W174E	FAA, MIAMI ARTCC	Key West Range Complex	010000AMSL	SURFACE	USN
W174F	FAA, MIAMI ARTCC	Key West Range Complex	FL700	SURFACE	USN
W174G	FAA, MIAMI ARTCC	Key West Range Complex	FL700	SURFACE	USN
W177A(A)	FAA, JACKSONVILLE ARTCC	Shaw AFB	FL500	SURFACE	USAF
W177A(B)	FAA, JACKSONVILLE ARTCC	Shaw AFB	FL500	06001AMSL	USAF
W177B	FAA, JACKSONVILLE ARTCC	Shaw AFB	FL300	SURFACE	USAF
W186	FAA, HONOLULU CTL FAC	Hawaiian Islands Range Complex	009000AMSL	SURFACE	USN
W187	FAA, HONOLULU CTL FAC	Hawaiian Islands Range Complex	FL180	SURFACE	USN
W188(A)	FAA, HONOLULU CTL FAC	Hawaiian Islands Range Complex	UNLTD	SURFACE	USN
W188(B)	FAA, HONOLULU CTL FAC	Hawaiian Islands Range Complex	UNLTD	SURFACE	USN
W189	FAA, HONOLULU CTL FAC	Hawaiian Islands Range Complex	UNLTD	SURFACE	USN
W190	FAA, HONOLULU CTL FAC	Hawaiian Islands Range Complex	UNLTD	SURFACE	USN
W191	FAA, HONOLULU CTL FAC	Hawaiian Islands Range Complex	003000AMSL	SURFACE	USN
W192	FAA, HONOLULU CTL FAC	Hawaiian Islands Range Complex	UNLTD	SURFACE	USN
W193	FAA, HONOLULU CTL FAC	Hawaiian Islands Range Complex	UNLTD	SURFACE	USN
W194	FAA, HONOLULU CTL FAC	Hawaiian Islands Range Complex	UNLTD	SURFACE	USN
W196	FAA, HONOLULU CTL FAC	Hawaiian Islands Range Complex	002000AMSL	SURFACE	USN
W228A	FAA, HOUSTON ARTCC	GOMEX Range Complex	FL450	SURFACE	USN
W228B	FAA, HOUSTON ARTCC	GOMEX Range Complex	FL450	SURFACE	USN
W228C	FAA, HOUSTON ARTCC	GOMEX Range Complex	FL450	SURFACE	USN

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
W228D	FAA, HOUSTON ARTCC	GOMEX Range Complex	FL450	SURFACE	USN
W237A(HI)	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	FL500	FL230	USN
W237A(LO)	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	FL230	SURFACE	USN
W237B(HI)	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	FL500	FL230	USN
W237B(LO)	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	FL230	SURFACE	USN
W237C	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	UNLTD	SURFACE	USN
W237D	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	UNLTD	SURFACE	USN
W237E	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	FL270	SURFACE	USN
W237F	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	UNLTD	SURFACE	USN
W237G	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	UNLTD	SURFACE	USN
W237H	FAA, OAKLAND ARTCC	Whidbey Island Range Complex	FL270	SURFACE	USN
W237J	FAA, OAKLAND ARTCC	Whidbey Island Range Complex	FL270	SURFACE	USN
W260	FAA, OAKLAND ARTCC	Northern California Range Complex	FL600	SURFACE	USN
W283	FAA, OAKLAND ARTCC	Northern California Range Complex	FL600	SURFACE	USN
W285A	NORCAL TRACON	Northern California Range Complex	FL450	SURFACE	USN
W285B	NORCAL TRACON	Northern California Range Complex	FL190	SURFACE	USN
W285C	NORCAL TRACON	Northern California Range Complex	FL450	FL190	USN
W285D	NORCAL TRACON	Northern California Range Complex	FL190	SURFACE	USN
W289E	FAA, LOS ANGELES ARTCC	Pt. Mugu Range Complex	UNLTD	SURFACE	USN
W289N	FAA, LOS ANGELES ARTCC	Pt. Mugu Range Complex	FL240	SURFACE	USN
W289S	FAA, LOS ANGELES ARTCC	Pt. Mugu Range Complex	UNLTD	SURFACE	USN
W289W	FAA, LOS ANGELES ARTCC	Pt. Mugu Range Complex	UNLTD	SURFACE	USN
W291	FAA, LOS ANGELES ARTCC	SOCAL Range Complex	FL800	SURFACE	USN
W292E	FAA, LOS ANGELES ARTCC	Pt. Mugu Range Complex	UNLTD	SURFACE	USN
W292W	FAA, LOS ANGELES ARTCC	Pt. Mugu Range Complex	UNLTD	SURFACE	USN
W386	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W386(A)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	FL230	SURFACE	USN
W387A	USN, FACSAC VACAPES	VACAPES Range Complex	023999AMSL	SURFACE	USN
W387B	USN, FACSAC VACAPES	VACAPES Range Complex	UNLTD	FL240	USN
W412	FAA, LOS ANGELES ARTCC	Pt. Mugu Range Complex	003000AMSL	SURFACE	USN
W453A	FAA, HOUSTON ARTCC	CRTC Gulfport	006000AMSL	SURFACE	USAF(ANG)
W453B	FAA, HOUSTON ARTCC	CRTC Gulfport	FL600	06000AMSL	USAF(ANG)
W465A	FAA, MIAMI ARTCC	Key West Range Complex	FL700	SURFACE	USN

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
W465B	FAA, MIAMI ARTCC	Key West Range Complex	FL700	SURFACE	USN
W465C	FAA, MIAMI ARTCC	Key West Range Complex	FL700	FL210	USN
W470A	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	SURFACE	USAF
W470B	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	SURFACE	USAF
W470C	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	SURFACE	USAF
W470D	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	SURFACE	USAF
W470E	FAA, MIAMI ARTCC	Eglin AFB	UNLTD	SURFACE	USAF
W470F	FAA, JACKSONVILLE ARTCC	Eglin AFB	UNLTD	SURFACE	USAF
W497A	FAA, MIAMI ARTCC	Patrick AFB	UNLTD	SURFACE	USAF
W497B	FAA, MIAMI ARTCC	Patrick AFB	UNLTD	SURFACE	USAF
W506	FAA, NEW YORK ARTCC	NE ADS/DOOS, NY ANG	FL500	SURFACE	USAF
W50A	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	FL750	SURFACE	USN
W50B	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	FL750	SURFACE	USN
W50C	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	FL750	SURFACE	USN
W513	FAA, OAKLAND ARTCC	San Francisco Range Complex	FL600	SURFACE	USN
W532E	FAA, LOS ANGELES ARTCC	Pt. Mugu Range Complex	UNLTD	SURFACE	USN
W532N	FAA, LOS ANGELES ARTCC	Pt. Mugu Range Complex	UNLTD	SURFACE	USN
W532S	FAA, LOS ANGELES ARTCC	Pt. Mugu Range Complex	UNLTD	SURFACE	USN
W537	FAA, LOS ANGELES ARTCC	Pt. Mugu Range Complex	UNLTD	SURFACE	USN
W54A	FAA, HOUSTON ARTCC	New Orleans NAS JRB	FL400	SURFACE	USN
W54B	FAA, HOUSTON ARTCC	New Orleans NAS JRB	FL240	SURFACE	USN
W54C	FAA, HOUSTON ARTCC	New Orleans NAS JRB	FL400	FL240	USN
W570	FAA, SEATTLE ARTCC	Whidbey Island Range Complex	FL500	SURFACE	USN
W59A	FAA, HOUSTON ARTCC	New Orleans NAS JRB	FL500	05000AMSL	USN
W59B	FAA, HOUSTON ARTCC	New Orleans NAS JRB	027999AMSL	05000AMSL	USN
W59C	FAA, HOUSTON ARTCC	New Orleans NAS JRB	FL500	FL280	USN
W602	FAA, HOUSTON ARTCC	GOMEX Range Complex	FL250	SURFACE	USN
W612	FAA, ANCHORAGE ARTCC	Elmendorf AFB	FL290	SURFACE	USAF
W72(13)A	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	001999AMSL	SURFACE	USN
W72(13)B	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	FL600	USN
W72(1A)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W72(1B)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W72(1C)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
W72(1D)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W72(1E)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W72(1F)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W72(20A)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	001999AMSL	SURFACE	USN
W72(20B)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	FL600	USN
W72(2A)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W72(2B)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W72(2C)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W72(2D)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W72(2E)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W72(2F)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W72(3A)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W72(3B)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W72(3C)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W72(3D)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W72(3E)	FAA, WASHINGTON, DC ARTCC	VACAPES Range Complex	UNLTD	SURFACE	USN
W74(A)	FAA, JACKSONVILLE ARTCC	MCAS Beaufort/Townsend Range Complex	010000AMSL	SURFACE	USMC
W74(B)	FAA, JACKSONVILLE ARTCC	MCAS Beaufort/Townsend Range Complex	010000AMSL	03001AMSL	USMC
W92	FAA, HOUSTON ARTCC	GOMEX Range Complex	FL400	SURFACE	USN
W93(A)	FAA, SEATTLE ARTCC	McChord AFB	FL500	SURFACE	USAF
W93(B)	FAA, SEATTLE ARTCC	McChord AFB	FL500	SURFACE	USAF
WARRIOR 1 HIGH MOA, LA	FAA, HOUSTON ARTCC	Fort Polk	018000AMSL	10000AMSL	USA
WARRIOR 1 LOW MOA, (XA) LA	FAA, HOUSTON ARTCC	Fort Polk	001500AGL	SURFACE	USA
WARRIOR 1 LOW MOA, (XB) LA	FAA, HOUSTON ARTCC	Fort Polk	001500AGL	SURFACE	USA
WARRIOR 1 LOW MOA, LA	FAA, HOUSTON ARTCC	Fort Polk	009999AMSL	00100AGL	USA
WARRIOR 2 HIGH MOA, LA	FAA, HOUSTON ARTCC	Fort Polk	018000AMSL	10000AMSL	USA
WARRIOR 2 LOW MOA, (XA) LA	FAA, HOUSTON ARTCC	Fort Polk	001500AGL	SURFACE	USA
WARRIOR 2 LOW MOA, (XB) LA	FAA, HOUSTON ARTCC	Fort Polk	001500AGL	SURFACE	USA
WARRIOR 2 LOW MOA, (XC) LA	FAA, HOUSTON ARTCC	Fort Polk	001500AGL	SURFACE	USA
WARRIOR 2 LOW MOA, LA	FAA, HOUSTON ARTCC	Fort Polk	009999AMSL	00100AGL	USA
WARRIOR 3 HIGH MOA, LA	FAA, HOUSTON ARTCC	Fort Polk	018000AMSL	10000AMSL	USA
WARRIOR 3 LOW MOA, (XA) LA	FAA, HOUSTON ARTCC	Fort Polk	001500AGL	SURFACE	USA

Table A-2 Special Use Airspace Inventory, continued

2018 SUA Name	Controlling Agency	Range Complex/ Installation Name	Upper Altitude	Lower Altitude	Military Service
WARRIOR 3 LOW MOA, (XB) LA	FAA, HOUSTON ARTCC	Fort Polk	001500AGL	SURFACE	USA
WARRIOR 3 LOW MOA, LA	FAA, HOUSTON ARTCC	Fort Polk	009999AMSL	00100AGL	USA
WASHITA MOA, OK	FAA, FORT WORTH ARTCC	Sheppard AFB	018000AMSL	08000AMSL	USAF
WESTOVER 1 MOA, TX	FAA, FORT WORTH ARTCC	Sheppard AFB	018000AMSL	09000AMSL	USAF
WESTOVER 2 MOA, TX	FAA, FORT WORTH ARTCC	Sheppard AFB	018000AMSL	10000AMSL	USAF
WHITMORE 1 MOA, CA	FAA, OAKLAND ARTCC	Beale AFB	018000AMSL	11000AMSL	USAF
WHITMORE 2 MOA, CA	FAA, OAKLAND ARTCC	Beale AFB	018000AMSL	11000AMSL	USAF
WHITMORE 3 MOA, CA	FAA, OAKLAND ARTCC	Beale AFB	018000AMSL	11000AMSL	USAF
YANKEE 1 MOA, NH	FAA, BOSTON ARTCC	103 TFG/DOC, CT ANG	018000AMSL	09000AMSL	USAF(ANG)
YANKEE 2 MOA, NH	FAA, BOSTON ARTCC	103 TFG/DOC, CT ANG	008999AMSL	00100AGL	USAF(ANG)
YUKON 1 MOA, (XA) AK	FAA, ANCHORAGE ARTCC	Eielson AFB	002000AGL	SURFACE	USAF
YUKON 1 MOA, (XB) AK	FAA, ANCHORAGE ARTCC	Eielson AFB	001500AGL	SURFACE	USAF
YUKON 1 MOA, (XC) AK	FAA, ANCHORAGE ARTCC	Eielson AFB	002000AMSL	SURFACE	USAF
YUKON 1 MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	018000AMSL	00100AGL	USAF
YUKON 2 MOA, (XA) AK	FAA, ANCHORAGE ARTCC	Eielson AFB	002000AGL	SURFACE	USAF
YUKON 2 MOA, (XB) AK	FAA, ANCHORAGE ARTCC	Eielson AFB	001500AGL	SURFACE	USAF
YUKON 2 MOA, (XCA) AK	FAA, ANCHORAGE ARTCC	Eielson AFB	002000AGL	SURFACE	USAF
YUKON 2 MOA, (XCB) AK	FAA, ANCHORAGE ARTCC	Eielson AFB	002000AGL	SURFACE	USAF
YUKON 2 MOA, (XD) AK	FAA, ANCHORAGE ARTCC	Eielson AFB	001500AGL	SURFACE	USAF
YUKON 2 MOA, (XE) AK	FAA, ANCHORAGE ARTCC	Eielson AFB	001500AGL	SURFACE	USAF
YUKON 2 MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	018000AMSL	00100AGL	USAF
YUKON 3 HIGH MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	018000AMSL	10000AMSL	USAF
YUKON 3A LOW MOA, (XA) AK	FAA, ANCHORAGE ARTCC	Eielson AFB	002000AGL	SURFACE	USAF
YUKON 3A LOW MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	009999AMSL	00100AGL	USAF
YUKON 3B MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	018000AMSL	02000AGL	USAF
YUKON 4 MOA, (XA) AK	FAA, ANCHORAGE ARTCC	Eielson AFB	002000AGL	SURFACE	USAF
YUKON 4 MOA, AK	FAA, ANCHORAGE ARTCC	Eielson AFB	018000AMSL	00100AGL	USAF
YUKON 5 MOA, AA1:F1239K	FAA, ANCHORAGE ARTCC	Eielson AFB	018000AMSL	05000AGL	USAF

Source: Department of Defense based on data from the National Geospatial-Intelligence Agency (Digital Aeronautical Flight Information File and DoD Flight Information Publication, Area Planning, Special Use Airspace North And South America (AP/1A) (effective: October 2017)).

Table A-2 Special Use Airspace Inventory, continued

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Table A-3 Military Training Routes Inventory

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
IR002	COMSTRKFIGHTWINGLANT, Oceana NAS, Virginia Beach, VA 23460 DSN 433-9141, C 757-4	FACSFAC VACAPES, Oceana NAS, Virginia Beach, VA 23460 DSN 433-1228, C757-433-122	Continuous	154
IR012	4 OSS/OSOR, Seymour Johnson AFB, NC 27531-5004 DSN 722-2672, C919-722-2672.	4 OSS/OSOS, Seymour Johnson AFB, NC 27531-5004 DSN 722-2129/2124, C919-722-2129/	Continuous	175
IR015	347 OSS/OSKA, Moody AFB, GA 31699-1899 DSN 460-4131, C229-257-4131.	23 OSS/OSOS, Moody AFB, GA 31699-1899 Mon-Fri 0730-1630L exc holidays DSN 460-78	Continuous	189
IR016	347 OSS/OSKA, Moody AFB, GA 31699-1899 DSN 460-4131, C229-257-4131.	23 OSS/OSOS, Moody AFB, GA 31699-1899 DSN 460-7831/7839 C229-257-7831/7839.Mon-F	Continuous	194
IR017	187 FW, 5187 Selma Highway, Montgomery, AL 36108-4824 DSN 358-9255, C334-394-725	Same as Originating Activity	1200-0400Z++	235
IR018	FACSFAC JAX, NAS Jacksonville, FL 32212 DSN 942-2004/2005, C904-542-2004/2005.	Same as Originating Activity	0700-2400 local daily	473
IR019	FACSFAC JAX, NAS Jacksonville, FL 32212 DSN 942-2004/2005, C904-542-2004/2005.	Same as Originating Activity	0700-2400 local daily	527
IR020	FACSFAC JAX, NAS Jacksonville, FL 32212 DSN 942-2004/2005, C904-542-2004/2005, A	Same as Originating Activity	0700-2400 local daily	443
IR021	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0400Z++ Mon-Fri, occasionally on weekends	528
IR022	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0400Z++ weekdays, occasional weekends	395
IR023	CO MCAS CHERRY POINT, ATTN DIROPS/RMD, Cherry Point, NC 28533 DSN 582-4040/4041,	Range Management Department, Mission Coordination/Future Operations, MCAS Cherry	Continuous	260
IR030	Commander Naval Air Warfare Center, Weapons Division, Code 52911GE, NAWS, Point	Commander Fleet Area Control and Surveillance Facility Jacksonville, NAS, Jackso	Daylight hours only, daily	304
IR031	Commander Naval Air Warfare Center, Weapons Division, Code 52911GE, NAWS, Point	Commander Fleet Area Control and Surveillance Facility Jacksonville, NAS, Jackso	Daylight hours only, daily	304
IR032	Commander Naval Air Warfare Center, Weapons Division, Code 52911GE, NAWS, Point	Commander Fleet Area Control and Surveillance Facility Jacksonville, Naval Air S	Daylight hours	192
IR033	Commander Naval Air Warfare Center, Weapons Division, Code 52911GE, NAWS, Point	Commander Fleet Area Control and Surveillance Facility Jacksonville, Naval Air S	Daylight hours	243
IR034	347 Rescue Wing, Detachment 1/RO, 8707 North Golf Course St., MacDill AFB, FL 33	347 Rescue Wing, Detachment 1/ROA, 8707 North Golf Course St., MacDill AFB, FL 3	0600-2400 local	167
IR035	437 OSS/OSO Joint Base Charleston, SC 29404 DSN 673-5554, C843-963-5554.	20 OSS/OSOS, Shaw AFB, SC 29152-5000 Duty hours DSN 965-1118/1119 C803-895-1118,	0600-2200 local, daily	239
IR036	437 OSS/OSO Joint Base Charleston, SC 29404 DSN 673-5554, C843-963-5554.	20 OSS/OSOS, Shaw AFB, SC 29152-5000 Duty hours DSN 965-1118/1119 C803-895-1118,	0600-2200 local, daily	213
IR037	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	Mon-Fri 1200-0400Z++, occasional weekends	248
IR038	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	Sunrise-Sunset, Mon-Fri, occasional weekends	457
IR040	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	Mon-Fri 1200-0400Z++, occasional weekends	205

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
IR044	COMTRAWING ONE, NAS Meridian, MS 39309-0136 DSN 637-2321, C601-679-2321.	Same as Originating Activity	Sunrise-Sunset	192
IR046	347 Rescue Wing, Detachment 1/RO, 8707 North Golf Course St., MacDill AFB, FL 33	347 Rescue Wing, Detachment 1/ROA, 8707 North Golf Course St., MacDill AFB, FL 3	0700-2400 local, daily	194
IR047	347 Rescue Wing, Detachment 1/RO, 8707 North Golf Course St., MacDill AFB, FL 33	347 Rescue Wing, Detachment 1/ROA, 8707 North Golf Course St., MacDill AFB, FL 3	0700-2400 local, daily	76
IR048	347 Rescue Wing, Detachment 1/RO, 8707 North Golf Course St., MacDill AFB, FL 33	347 Rescue Wing, Detachment 1/ROA, 8707 North Golf Course St., MacDill AFB, FL 3	0700-2400 local, daily	35
IR049	347 Rescue Wing, Detachment 1/RO, 8707 North Golf Course St., MacDill AFB, FL 33	347 Rescue Wing, Detachment 1/ROA, 8707 North Golf Course St., MacDill AFB, FL 3	0700-2400 local, daily	98
IR050	347 Rescue Wing, Detachment 1/RO, 8707 North Golf Course St., MacDill AFB, FL 33	347 Rescue Wing, Detachment 1/ROA, 8707 North Golf Course St., MacDill AFB, FL 3	0700-2400 local, daily	122
IR051	347 Rescue Wing, Detachment 1/RO, 8707 North Golf Course St., MacDill AFB, FL 33	347 Rescue Wing, Detachment 1/ROA, 8707 North Golf Course St., MacDill AFB, FL 3	0700-2400 local, daily	221
IR053	347 Rescue Wing, Detachment 1/RO, 8707 North Golf Course St., MacDill AFB, FL 33	347 Rescue Wing, Detachment 1/ROA, 8707 North Golf Course St., MacDill AFB, FL 3	0600-2400 local, daily	149
IR055	347 WG, Detachment 1/RO, 8707 North Golf Course St., MacDill AFB, FL 33621-5205	347 WG, Detachment 1/ROA, 8707 North Golf Course St., MacDill AFB, FL 33621-5205	0600-2400 local, daily	153
IR056	347 WG, Detachment 1/RO, 8707 North Golf Course St., MacDill AFB, FL 33621-5205	347 WG, Detachment 1/ROA, 8707 North Golf Course St., MacDill AFB, FL 33621-5205	0600-2400 local	230
IR057	1 SOAOS/DOGR, Hurlburt Field, FL 32544 DSN 579-7812/7813, C850-884-7812/7813.	Same as Originating Activity	Continuous	487
IR059	1 SOAOS/DOGR, Hurlburt Field, FL 32544 DSN 579-7812/7813, C850-884-7812/7813.	Same as Originating Activity	Continuous	510
IR062	COMSTRKFIGHTWINGLANT, Oceana NAS, Virginia Beach, VA 23460 DSN 433-9141, C757-43	FACSFAC VACAPES, Oceana , NAS Virginia Beach, VA 23460 DSN 433-1228, C757-433-12	Continuous	623
IR066	14 OSS/OSOP, Columbus AFB, MS 39710 DSN 742-2764, C662-434-2764.	50 FTS, Columbus AFB, MS 39710 DSN 742-7734/7735, C662-434-7734/7735.	Sunrise-Sunset Mon-Fri	346
IR067	14 OSS/OSOP, Columbus AFB, MS 39710 DSN 742-2764, C662-434-2764.	48 FTS, Columbus AFB, MS 39710 DSN 742-7840/7847, C662-434-7840/7847.	Sunrise-Sunset Mon-Fri	382
IR068	14 OSS/OSOP, Columbus AFB, MS 39710 DSN 742-2764, C662-434-2764.	48 FTS, Columbus AFB, MS 39710 DSN 742-7840/7847, C662-434-7840/7847.	Sunrise-Sunset Mon-Fri	180
IR070	14 OSS/OSOP, Columbus AFB, MS 39710-5000 DSN 742-2764, C662-434-2764.	48 FTS, Columbus AFB, MS 39710 DSN 742-7840/7847, C662-434-7840/7847.	Sunrise-Sunset daily	311
IR077	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0400Z++ Mon-Fri; occasional weekends	337
IR078	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0400Z++ Mon-Fri; occasional weekends	337
IR079	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0400Z++ Mon-Fri; occasional weekends	308
IR080	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0400Z++ Mon-Fri; occasional weekends	334

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
IR081	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0400Z++ Mon-Fri; occasional weekends	268
IR082	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0400Z++ Mon-Fri; occasional weekends	331
IR083	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0400Z++ Mon-Fri; occasional weekends	366
IR091	14 OSS/OSOP Columbus AFB, MS 39710-5000 DSN 742-3011/1221 C662-434-3011/1221.	50 FTS Columbus AFB, MS 39710 DSN 742-7734/7735, C662-434-7734/7735.	Sunrise-Sunset Mon-Fri	216
IR103	301 OG/SUA, NAS JRB Fort Worth, TX 76127 DSN 739-6903/6904/6905, C817-782-6903/6	Same as Originating Activity	0700-2200 local; OT by NOTAM	141
IR105	301 OG/SUA, NAS JRB, Ft. Worth, TX 76127 DSN 739-6903/6904/6905, C817-782-6903/6	Same as Originating Activity.	0700-2200 local; OT by NOTAM	256
IR107	27 SOAOS/DOOA, 301 S. Chindit Ave., Building 790, Rm 120 Cannon AFB, NM 88103 DS	27 SOAOS/DOOS, 301 S. Chindit Ave., Building 790, Rm 111 Cannon AFB, NM 88103 DS	Continuous	691
IR109	27 SOAOS/DOOA, 301 S. Chindit Ave., Building 790, Rm 120 Cannon AFB, NM 88103 DS	27 SOAOS/DOOS, 301 S. Chindit Ave., Building 790, Rm 111 Cannon AFB, NM 88103 DS	Continuous	835
IR111	27 SOAOS/DOOA, 301 S. Chindit Ave., Building 790, Rm 120 Cannon AFB, NM 88103 DS	27 SOAOS/DOOS, 301 S. Chindit Ave., Building 790, Rm 111 Cannon AFB, NM 88103 DS	Continuous	720
IR112	27 SOAOS/DOOA, 301 S. Chindit Ave., Building 790, Rm 120 Cannon AFB, NM 88103 DS	27 SOAOS/DOOS, 301 S. Chindit Ave., Building 790, Rm 111 Cannon AFB, NM 88103 DS	Continuous	722
IR113	27 SOAOS/DOOA, 301 S. Chindit Ave., Building 790, Rm 120 Cannon AFB, NM 88103 DS	27 SOAOS/DOOS, 301 S. Chindit Ave., Building 790, Rm 111 Cannon AFB, NM 88103 DS	Continuous	998
IR117	188th Wing - AR ANG, 4850 Leigh Ave., Fort Smith, AR 72903 DSN 778-5502, C479-57	Same as Originating Activity.	Continuous	229
IR120	188th Wing - AR ANG, 4850 Leigh Ave., Fort Smith, AR 72903 DSN 778-5502, C479-57	Same as Originating Activity.	Continuous	99
IR121	188th Wing - AR ANG, 4850 Leigh Ave., Fort Smith, AR 72903 DSN 778-5502, C479-57	Same as Originating Activity.	Continuous	144
IR123	301 OG/SUA, NAS Fort Worth, 1425 Carswell Ave, TX 76127 DSN 739-6903/6904/6905,	Same as Originating Activity	0700-2200 local; OT by NOTAM	468
IR124	301 OG/SUA, NAS Fort Worth, 1425 Carswell Ave., TX 76127 DSN 739-6903/6904/6905,	Same as Originating Activity	0700-2200 local; OT by NOTAM	287
IR126	7 OSS/OSR, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3666, C325-696-366	7 OSS/OSOS, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3665, C325-696-36	Continuous	880
IR127	47 OSS/OSOR, 570 2nd St, Ste 6., Laughlin AFB, TX 78843, C830-298-5864, DSN 732-	86th FTS/DOS, 307 2nd St., Laughlin AFB, TX 78843 DSN 732-5584, C830-298-5584.	Sunrise-Sunset Mon-Fri	284
IR128	7 OSS/OSR, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3666, C325-696-366	7 OSS/OSOS, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3665, C325-696-36	Continuous	694
IR129	47 OSS/OSOR, 570 2nd ST STE. 6, Laughlin AFB, TX 78843 DSN 732-5864	86 FTS/DOS 307 2nd St, Laughlin AFB, TX 78843 C803-298-5584 DSN 732-5584	Sunrise-Sunset Mon-Fri	331
IR133	49 OSS/OSOA, 744 Delaware Ave., Holloman AFB, NM 88330-8014 DSN 572-2638, C575-5	49 OSS/OSOS, 744 Delaware Ave., Holloman AFB, NM 88330-8014 DSN 572-3536, C575-5	0700-2300 local	363
IR134	49 OSS/OSOA, 744 Delaware Ave., Holloman AFB, NM 88440-8014 DSN 572-3244, C575-5	49 OSS/OSOS, 744 Delaware Ave., Holloman AFB, NM 88330-8014 DSN 572-3536, C575-5	Sunrise-0600Z++	282

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
IR135	COMTRAWING TWO, NAS Kingsville, TX 78363 DSN 876-6518/6283, C361-516-6518/6283/6	Same as Originating Activity	Sunrise-Sunset, daily	153
IR136	COMTRAWING TWO, NAS Kingsville, TX 78363 DSN 876-6518/6283, C361-516-6518/6283/6	Same as Originating Activity	Sunrise-Sunset, daily	183
IR137	58 OSS/OSO, 4301 Randolph Ave., Kirtland AFB, NM 87117-5835 DSN 263-5979/5888/57	Same as Originating Activity	Continuous	273
IR139	301 OG/SUA, NAS JRB Fort Worth, TX 76127 DSN 739-6903/6904/6905, C817-782-6903/6	Same as Originating Activity	0700-2200 local; OT by NOTAM	120
IR142	49 OSS/OSOA, 744 Delaware Ave., Holloman AFB, NM 88330-8014 DSN 572-2638, C575-5	49 OSS/OSOS, 744 Delaware Ave., Holloman AFB, NM 88330-8014 DSN 572-3536, C575-5	0700-2300L	249
IR145	71 OSS, 301 Gritz St., Vance AFB, OK 73705-5202 DSN 448-6276/7820, C580-213-6276	Same as Originating Activity.	30 min after Sunrise-30 min before Sunset and active days per local directives	231
IR146	71 OSS, 301 Gritz St., Vance AFB, OK 73705-5202 DSN 448-6276/7820, C580-213-6276	Same as Originating Activity.	30 min after Sunrise-30 min before Sunset and active days per local directives	230
IR147	COMTRAWING TWO, NAS Kingsville, TX 78363 DSN 876-6518/6283, C361-516-6518/6283/6	Same as Originating Activity	Sunrise to 30 minutes after Sunset, daily	138
IR148	COMTRAWING TWO, NAS Kingsville, TX 78363 DSN 876-6518/6283, C361-516-6518/6283/6	Same as Originating Activity	Daily 0600-2230 local	197
IR149	COMTRAWING TWO, NAS Kingsville, TX 78363 DSN 876-6518.	Same as Originating Activity	Daily 0600-2230 local	243
IR150	7 OSS/OSR, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3666, C325-696-366	7 OSS/OSOS, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3665, C325-696-36	Continuous	478
IR154	97 OSS/DOA, 101 South Sixth Street, Bldg 225, Altus AFB, OK 73521 DSN 866-6098,	97 OSS/OSK, 101 South Sixth Street, Bldg 225, Altus AFB, OK 73521 DSN 866-7422/1	0830-0230 local Mon-Fri	264
IR155	97 OSS/DOA, 101 South Sixth Street, Bldg 225, Altus AFB, OK 73521 DSN 866-6098,	97 OSS/OSK, 101 South Sixth Street, Bldg 225, Altus AFB, OK 73521 DSN 866-7110,	0830-0230 local Mon-Fri	258
IR164	188th Wing - AR ANG, 4850 Leigh Ave., Fort Smith, AR 72903 DSN 778-5502, C479-57	Same as Originating Activity.	Continuous	132
IR166	COMTRAWING TWO, NAS Kingsville, TX 78363 DSN 876-6518.	Same as Originating Activity	0600-2400 local, daily	207
IR167	COMTRAWING TWO, NAS Kingsville, TX 78363 DSN 876-6518.	Same as Originating Activity	0600-2400 local, daily	133
IR169	47 OSS/OSOR, 570 2nd Street, Ste. 6, Laughlin AFB, TX 78843 DSN 732-5864, C830-2	87 FTS/DOS, 570 2nd Street, Laughlin AFB, TX 78843 DSN 732-5484, C830-298-5484.	Sunrise-Sunset daily	205
IR170	47 OSS/OSOR, 570 2nd Street, Ste. 6, Laughlin AFB, TX 78843-5222 DSN 732-5864, C	87 FTS/DOS, 570 2nd Street, Laughlin AFB, TX 78843 DSN 732-5484, C830-298-5484.	Sunrise-Sunset daily	218
IR171	71 OSS, 301 Gritz St., Vance AFB, OK 73705-5202 DSN 448-6276/7820, C580-213-6276	Same as Originating Activity.	30 min after Sunrise-30 min before Sunset and active days per local directives	217
IR172	71 OSS, 301 Gritz St., Vance AFB, OK 73705-5202 DSN 448-6276/7820, C580-213-6276	Same as Originating Activity.	30 min after Sunrise-30 min before Sunset and active days per local directives	203
IR173	71 OSS, 301 Gritz St., Vance AFB, OK 73705-5202 DSN 448-6276/7820, C580-213-6276	Same as Originating Activity.	30 min after Sunrise-30 min before Sunset and active days per local directives	197
IR174	188th Wing - AR ANG, 4850 Leigh Ave., Fort Smith, AR 72903 DSN 778-5502, C479-57	Same as Originating Activity.	Continuous	594
IR175	71 OSS, 301 Gritz St., Vance AFB, OK 73705-5202 DSN 448-6276/7820, C580-213-6276	Same as Originating Activity.	30 min after Sunrise-30 min before Sunset and active days per local directives	254
IR177	7 OSS/OSR, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3666, C325-696-366	7 OSS/OSOS, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3665, C325-696-36	Continuous	735

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
IR178	7 OSS/OSR, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3666, C325-696-366	7 OSS/OSOS, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3665, C325-696-36	Continuous	986
IR180	7 OSS/OSR, 965 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3666, C325-696-366	7 OSS/OSOS, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3665, C325-696-36	Continuous	755
IR181	71 OSS, 301 Gritz St., Vance AFB, OK 73705-5202 DSN 448-6276/7820, C580-213-6276	Same as Originating Activity.	30 min after Sunrise-30 min before Sunset and active days per local directives	217
IR182	71 OSS, 301 Gritz St., Vance AFB, OK 73705-5202 DSN 448-6276/7820, C580-213-6276	Same as Originating Activity.	30 min after Sunrise-30 min before Sunset and active days per local directives	203
IR183	71 OSS, 301 Gritz St., Vance AFB, OK 73705-5202 DSN 448-6276/7820, C580-213-6276	Same as Originating Activity.	30 min after Sunrise-30 min before Sunset and active days per local directives	197
IR185	71 OSS, 301 Gritz St., Vance AFB, OK 73705-5202 DSN 448-6276/7820, C580-213-6276	Same as Originating Activity.	30 min after Sunrise-30 min before Sunset and active days per local directives	254
IR192	49 OSS/OSOA, 744 Delaware Ave., Holloman AFB, NM 88330-8014 DSN 572-3536, C575-5	49 OSS/OSOS, 744 Delaware Ave., Holloman AFB, NM 88330-8014 DSN 572-3536, C575-5	Sunrise-0600Z++	557
IR193	97 OSS/DOA, 101 South Sixth Street, Bldg 225, Altus AFB, OK 73521 DSN 866-6098,	97 OSS / OSK, 101 South Sixth Street, Bldg 225, Altus AFB, OK 73521 DSN 866-7422	0830-0230 local Mon-Fri	173
IR194	49 OSS/OSOA, 744 Delaware Ave., Holloman AFB, NM 88330-8014 DSN 572-3536, C575-5	49 OSS/OSOS, 744 Delaware Ave., Holloman AFB, NM 88330-8014 DSN 572-3536, C575-5	Sunrise-0600Z++	612
IR195	49 OSS/OSOA, 744 Delaware Ave., Holloman AFB, NM 88330-8014 DSN 572-3536, C575-5	49 OSS/OSOS, 744 Delaware Ave., Holloman AFB, NM 88330-8014 DSN 572-3536, C575-5	Sunrise-0600Z++	279
IR200	Commander Naval Air Warfare Center, Weapons Division, Code P529800E, (Naval Base	Commander Naval Air Warfare Center, Weapons Division, Code P529800E, (Naval Base	Sunrise-Sunset by NOTAM	811
IR203	Commander Strike Fighter Wing, US. Pacific Fleet, 001 (K) Street, Room 121, NAS	Same as Originating Activity	Daylight hours, OT by NOTAM	512
IR206	Commander Naval Air Warfare Center, Weapons Division, Code P3524, NAWS, Pt. Mugu	Commander Naval Air Warfare Center, Weapons Division, Code P3506, NAWS, Pt. Mugu	Daylight hours by NOTAM	153
IR207	Commander Strike Fighter Wing, US. Pacific Fleet, 001 (K) Street, Room 121, NAS	Same as Originating Activity	Daylight hours, OT by NOTAM	578
IR211	G-3, 3D MAW, MCAS Miramar, San Diego, CA 92145 DSN 267-5157, C858-577-5157. Non-	Flight Planning, MCAS Miramar, San Diego, CA 92145, DSN 267-4981/1532.	Continuous	185
IR212	G-3, 3D MAW, MCAS Miramar, San Diego, CA 92145 DSN 267-5157, C858-577-5157. Non-	Flight Planning, MCAS Miramar, San Diego, CA 92145, DSN 267-4981/1532.	Continuous	167
IR213	G-3, 3D MAW, MCAS Miramar, San Diego, CA 92145 DSN 267-5157, C858-577-5157. Non-	Flight Planning, MCAS Miramar, San Diego, CA 92145, DSN 267-4981/1532.	Continuous	328
IR214	G-3, 3D MAW, MCAS Miramar, San Diego, CA 92145 DSN 267-5157, C858-577-5157. Non-	Flight Planning, MCAS Miramar, San Diego, CA 92145, DSN 267-4981/1532.	Even numbered days only	321
IR216	G-3, 3D MAW, MCAS Miramar, San Diego, CA 92145 DSN 267-5157, C858-577-5157. Non-	Flight Planning, MCAS Miramar, San Diego, CA 92145, DSN 267-4981/1532.	Even numbered days- daylight only	63
IR217	G-3, 3D MAW, MCAS Miramar, San Diego, CA 92145 DSN 267-5157, C858-577-5157. Non-	Flight Planning, MCAS Miramar, San Diego, CA 92145, DSN 267-4981/1532.	Continuous	344

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
IR218	G-3, 3D MAW, MCAS Miramar, San Diego, CA 92145 DSN 267-5157, C858-577-5157. Non-	Flight Planning, MCAS Miramar, San Diego, CA 92145, DSN 267-4981/1532.	Continuous	274
IR234	Commander AFFTC, 412 OSS/OSAA, 235 S Flightline Rd, Edwards AFB, CA 93523-6460 D	Commander AFFTC, 412 OSS/OSR, 300 E Yeager Blvd, Edwards AFB, CA 93524 DSN 527-4	Daylight hours by NOTAM	212
IR235	Commander AFFTC, 412 OSS/OSAA, 235 S Flightline Rd, Edwards AFB, CA 93523-6460 D	Commander AFFTC, 412 OSS/OSR, 300 E Yeager Blvd, Edwards AFB, CA 93524 DSN 527-4	Daylight hours by NOTAM	212
IR236	Commander 412 FTW, 412 OSS/OSO, 100 East Sparks Rd, Edwards AFB, CA 93523-6460 D	Commander AFFTC, 412 OSS/OSR, 300 E Yeager Blvd, Edwards AFB, CA 93524 DSN 527-4	0600-2200 local, daily	396
IR237	Commander AFFTC, 412 OSS/OSAA, 235 S Flightline Rd, Edwards AFB, CA 93523-6460 D	Commander AFFTC, 412 OSS/OSR, 300 E Yeager Blvd, Edwards AFB, CA 93524 DSN 527-4	Daylight hours by NOTAM	166
IR238	Commander AFFTC, 412 OSS/OSAA, 235 S Flightline Rd, Edwards AFB, CA 93523-6460 D	Commander AFFTC, 412 OSS/OSCS, 306 E. Popson, Edwards AFB, CA 93524-6680 DSN 527	Daylight hours by NOTAM	166
IR250	G-3, 3D MAW, MCAS Miramar, San Diego, CA 92145 DSN 267-4981, C858-577-4981. Non-	Flight Planning, MCAS Miramar, San Diego, CA 92145, DSN 267-4981/1532.	Daylight hours on even numbered days	303
IR252	G-3, 3D MAW, MCAS Miramar, San Diego, CA 92145 DSN 267-4981, C858-577-4981. Non-	Flight Planning, MCAS Miramar, San Diego, CA 92145, DSN 267-4981/1532.	Daylight hours on odd numbered days	192
IR254	G-3, 3D MAW, MCAS Miramar, San Diego, CA 92145 DSN 267-4981, C858-577-4981. Non-	Flight Planning, MCAS Miramar, San Diego, CA 92145, DSN 267-4981/1532.	Daylight hours, Mon-Fri	120
IR255	G-3, 3D MAW, MCAS Miramar, San Diego, CA 92145 DSN 267-4981, C858-577-4981. Non-	Flight Planning, MCAS Miramar, San Diego, CA 92145, DSN 267-4981/1532.	Daylight hours, daily	81
IR264	60 OSS/OSO, 611 E St., Travis AFB, CA 94535 DSN 837-1075, C707-424-1075.	60 OSS/OSO, 611 E St., Travis AFB, CA 94535 DSN 837-5145, C707-424-5145.	By NOTAM	506
IR266	7 OSS/OSR, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3666, C325-696-366	7 OSS/OSOS, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3665, C325-696-36	Continuous	606
IR275	60 OSS/OSO, 611 E St., Travis AFB, CA 94535 DSN 837-1075, C707-424-1075.	60 OSS/OSO, 611 E St., Travis AFB, CA 94535 DSN 837-5145, C707-424-5145.	By NOTAM	871
IR280	60 OSS/OSO, 611 E St., Travis AFB, CA 94535 DSN 837-1075, C707-424-1075.	60 OSS/OSO, 611 E St., Travis AFB, CA 94535 DSN 837-5145, C707-424-5145.	By NOTAM	365
IR281	60 OSS/OSO, 611 E St., Travis AFB, CA 94535 DSN 837-1075, C707-424-1075.	60 OSS/OSO, 611 E St., Travis AFB, CA 94535 DSN 837-5145, C707-424-5145.	By NOTAM	386
IR282	60 OSS/OSO, 611 E St., Travis AFB, CA 94535 DSN 837-1075, C707-424-1075.	60 OSS/OSO, 611 E St., Travis AFB, CA 94535 DSN 837-5145, C707-424-5145.	By NOTAM	247
IR286	57 OSS/OSM, Nellis AFB, NV 89191 DSN 682-7891, C702-652-7891.	57 OSS/OSOS, 4450 Tyndall Ave., Nellis AFB, NV 89191 DSN 682-2040, C702-652-2040	Continuous	486
IR293	388 RANS/RST, 6606 Cedar Ln. bldg 1274, Hill AFB, UT 84056-5812 DSN 777-4401 C80	Same as Originating Activity.	By NOTAM	403
IR300	366 OSS/OSOA, Mountain Home AFB, ID 83648 DSN 728-4722 C208-828-2172. Airspace M	366 OSS/OSOS, Mountain Home AFB, ID 83648 DSN 728-4607/2172/4631 C208-828-4607/2	By NOTAM	527

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
IR301	124 WG, Gowen Field, Boise, ID 83705 DSN 422-5348, C208-422-5348.	366 OSS/OSOS, Mountain Home AFB, ID 83648 DSN 728-4607/2172, C208-828-4607/2172/	Continuous or by NOTAM	569
IR302	124 WG, Gowen Field, Boise, ID 83705 DSN 422-5348, C208-422-5348.	124 OSS/OSO, 3996 W. Aeronca, Gowen Field, Boise, ID 83705 DSN 422-6127/5335, C2	Continuous or by NOTAM	612
IR303	366 OSS/OSOA, 1050 Desert Street, Mountain Home AFB, ID 83648 DSN 728-4722, C208	Same as Originating Activity. Scheduling requests accepted 0730-1630 local Mon-F	By NOTAM	354
IR304	366 OSS/OSOS, Mountain Home AFB, Mountain Home AFB, ID 83648 DSN 728-2172/4607,	Same as Originating Activity. Scheduling requests 0730-1630 local Mon-Fri. Must	By NOTAM	431
IR305	124 WG, Gowen Field, Boise, ID 83705 DSN 422-5348, C208-422-5348.	366 OSS/OSOS, Mountain Home AFB, ID 83648, DSN 728-4607/2172, C208-828-4607/2172	Continuous or by NOTAM	569
IR307	124 WG, Gowen Field, Boise, ID 83705 DSN 422-5348, C208-422-5348.	366 OSS/OSOS, Mountain Home AFB, ID 83648, DSN 728-4607/2172. C208-828-4607/2172	Continuous or by NOTAM	569
IR308	58 OSS/OSO, 4301 Randolph Ave., Kirtland AFB, NM 87117-5835 DSN 263-5979/5888/57	Same as Originating Activity	Continuous	274
IR313	366 OSS/OSOA, Mountain Home AFB, ID 83648 DSN 728-4722 C208-828-4722. Airspace M	366 OSS/OSOS, Mountain Home AFB, ID 83648 DSN 728-4607/2172/4631 C208-828-4607/2	By NOTAM	605
IR320	7 OSS/OSR, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3666, C325-696-366	7 OSS/OSOS, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3665, C325-696-36	Continuous	749
IR324	62 OSS/OSK, 1172 Levitow Blvd., McChord Fld, WA 98438 DSN 382-3615, C253-982-361	62 OSS/OSO, 100 Main St., McChord Fld, WA 98438 DSN 382-9925, C253-982-9925. Dut	Continuous	257
IR325	62 OSS/OSK, 1172 Levitow Blvd., McChord Fld, WA 98438 DSN 382-4057, C253-982-361	62 OSS/OSO, 100 Main St., McChord Fld, WA 98438 DSN 382-9925, C253-982-9925. Dut	Continuous	239
IR326	62 OSS/OSK, 1172 Levitow Blvd., McChord Fld, WA 98438 DSN 382-3615 C253-982-3615.	62 OSS/OSO, 100 Main St., McChord Fld, WA 98438 DSN 382-9925. Duty hours 0800-17	Continuous	269
IR327	62 OSS/OSK, 1172 Levitow Blvd., McCord Fld, WA 98438 DSN 382-3615, C253-982-3615	62 OSS/OSO, 100 Main St., McChord Fld, WA 98438 DSN 382-9925, C253-982-9925. Dut	Continuous	249
IR328	62 OSS/OSK, 1172 Levitow Blvd., McCord Fld, WA 98438 DSN 382-3615, C253-982-3615	62 OSS/OSO, 100 Main St., McChord Fld, WA 98438 DSN 382-9925, C253-982-9925. Dut	Continuous	231
IR329	62 OSS/OSK, 1172 Levitow Blvd., McChord Fld, WA 98438 DSN 382-3615, C253-982-361	62 OSS/OSO, 100 Main St., McChord Fld, WA 98438 DSN 382-9925, C253-982-9925. Non	Continuous	226
IR330	62 OSS/OSK, 1172 Levitow Blvd., McChord Fld, WA 98438 DSN 382-3615, C253-982-361	62 OSS/OSO, 100 Main St., McChord Fld, WA 98438 DSN 382-9925, C253-982-9925. Dut	Continuous	166
IR341	Commanding Officer (N38), NAS Whidbey Island, 3730 N. Charles Porter Ave., Oak H	Same as Originating Activity. Scheduling hours 0700-1600 local, Mon-Fri only. Sa	Continuous	427
IR342	Commanding Officer, NAS Whidbey Island, 3730 N. Charles Porter Ave, Oak Harbor,	ATCFO (N33), NAS Whidbey Island, 3730 N. Charles Porter Ave, Oak Harbor, WA 9827	Continuous	458
IR343	Commanding Officer (N38), NAS Whidbey Island, 3730 N. Charles Porter Ave., Oak H	Same as Originating Activity. Scheduling hours 0700-1600 local, Mon-Fri only. Sa	Continuous	678

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
IR344	Commanding Officer (N38), NAS Whidbey Island, 3730 N. Charles Porter Ave., Oak H	Same as Originating Activity. Scheduling hours 0700-1600 local, Mon-Fri only. Sa	Continuous	463
IR346	Commanding Officer (N38), NAS Whidbey Island, 3730 N. Charles Porter Ave., Oak H	Same as Originating Activity. Scheduling hours 0700-1600 local, Mon-Fri only. Sa	Continuous	466
IR348	Commanding Officer (N38), NAS Whidbey Island, 3730 N. Charles Porter Ave., Oak H	Same as Originating Activity. Scheduling hours 0700-1600 local, Mon-Fri only. Sa	Continuous	447
IR409	140th OG/CC Buckley ANGB Aurora, CO 80011-9546 DSN 847-9466, C720-847-9466.	140th OG/CC Buckley AFB Aurora, CO 80011-9546. Duty Hrs 0700-1700 DSN 847-9472,	0800-1600 local, Tue-Sat	245
IR414	140th Wing/Airspace Office Buckley AFB Aurora, CO 80011-9546 DSN 847-9470/9471,	140th Wing/Airspace Office Buckley AFB Aurora, CO 80011-9546. Duty Hrs 0700-1700	0800-1600 local, Tue-Sat; OT by NOTAM	136
IR415	140th OG/CC Buckley ANGB Aurora, CO 80011-9546 DSN 847-9466, C720-847-9466.	140th OG/CC Buckley AFB Aurora, CO 80011-9546. Duty Hrs 0700-1700 DSN 847-9472,	0800-1600 local, Tue-Sat; OT by NOTAM	224
IR416	140th Wing/Airspace Office Buckley AFB Aurora, CO 80011-9546 DSN 847-9470/9471,	140th Wing/Airspace Office Buckley AFB Aurora, CO 80011-9546. Duty Hrs 0700-1700	0800-1600 local, Tue-Sat; OT by NOTAM	424
IR418	388 RANS/RST, 6066 Cedar Lane, Hill AFB, UT 84056-5812 DSN 777-9384, C801-777-93	388 RANS/RST, 6066 Cedar Lane, Hill AFB, UT 84056-5812 DSN 777-4401, C801-777-44	0700-2400 local Mon-Thu, 0700-1800 local Fri, 0800-1700 local Sat	59
IR420	388 RANS/RST, 6066 Cedar Lane, Hill AFB, UT 84056-5812 DSN 777-9384, C801-777-93	388 RANS/RST, 6066 Cedar Lane, Hill AFB, UT 84056-5812 DSN 777-4401, C801-777-44	0700-2400 local Mon-Thu, 0700-1800 local Fri, 0800-1700 local Sat	53
IR424	140th Wing/Airspace Office Buckley AFB Aurora, CO 80011-9546 DSN 847-9470/9471,	140th Wing/Airspace Office Buckley AFB Aurora, CO 80011-9546. Duty Hrs 0700-1700	0800-1600 local, Tue-Sat; OT by NOTAM	194
IR425	Commander 412 TW, 412 OSS/OSOS, 235 S. Flightline Rd., Edwards AFB, CA 93523-646	Commander 412 TW, 412 OSS/OSOS, 235 S. Flightline Rd., Edwards AFB, CA 93523-646	Sunrise-Sunset by NOTAM	811
IR460	4-160th SOAR (A), Mail Stop 23B, 41st Division Rd., Joint Base Lewis McChord, WA	Same as Originating Activity.	Continuous	165
IR461	4-160th SOAR (A), Mail Stop 23B, 41st Division Rd., Joint Base Lewis McChord, WA	Same as Originating Activity.	Continuous	165
IR473	28 OSS/OSXA, 1956 Scott Dr., Ste. 201, Ellsworth AFB, SD 57706-4710 DSN 675-1230	28 OSS/OSXS, 1956 Scott Dr., Ste. 201, Ellsworth AFB, SD 57706-4710 DSN 675-4246	Continuous	1000
IR479	120 FW/OSAD (ANG) 2800 Airport Ave. B, Great Falls, MT 59404 DSN 791-0192, C406-	Same as Originating Activity	By NOTAM	871
IR480	120 FW/OSAD (ANG) 2800 Airport Ave. B, Great Falls, MT 59404 DSN 791-0192, C406-	Same as Originating Activity	By NOTAM	626
IR485	28 OSS/OSXA, 1956 Scott Dr., Ste. 201, Ellsworth AFB, SD 57706-4710 DSN 675-1230	28 OSS/OSXS, 1956 Scott Dr., Ste. 201, Ellsworth AFB, SD 57706-4710 DSN 675-4246	Continuous	435
IR492	28 OSS/OSXA, 1956 Scott Dr., Ste. 201, Ellsworth AFB, SD 57706-4710 DSN 675-1230	28 OSS/OSXS, 1956 Scott Dr., Ste. 201, Ellsworth AFB, SD 57706-4710 DSN 675-4246	Continuous	834
IR499	28 OSS/OSXA, 1956 Scott Dr., Ste. 201, Ellsworth AFB, SD 57706-4710 DSN 675-1230	28 OSS/OSXS, 1956 Scott Dr., Ste. 201, Ellsworth AFB, SD 57706-4710 DSN 675-4246	Continuous	490
IR500	7 OSS/OSR, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3666, C325-696-366	7 OSS/OSOS, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3665, C325-696-36	Continuous	806
IR501	7 OSS/OSR, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3666, C325-696-366	7 OSS/OSOS, 966 Ave. D-4, Ste. 10, Dyess AFB, TX 79607 DSN 461-3665, C325-696-36	Continuous	737

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
IR504	509 OSS/OSOA, 905 Spirit Blvd., Whiteman AFB, MO 65305 DSN 975-7616/1779/1754, C	Same as Originating Activity	Continuous	345
IR505	114 FW (ANG), Joe Foss Field, Sioux Falls, SD 57104-0264 DSN 798-7754/46, C605-9	Same as Originating Activity	Daylight hours, Mon-Sat, OT By NOTAM	282
IR508	114 FW (ANG), Joe Foss Field, Sioux Falls, SD 57104-0264 DSN 798-7745, C605-988-	114 FW (ANG), Joe Foss Field, Sioux Falls, SD 57104-0264 DSN 798-7754/7746, C605	Daylight hours, Mon-Sat, OT by NOTAM	377
IR509	114 FW (ANG), Joe Foss Field, Sioux Falls, SD 57104-0264 DSN 798-7745, C605-988-	114 FW (ANG), Joe Foss Field, Sioux Falls, SD 57104-0264 DSN 798-7754/7746, C605	Daylight hours, Tue-Sat, OT by NOTAM	419
IR513	DET 1, 184 IW, Smoky Hill ANG Range, 8429 W Farrelly Rd, Salina, KS 67401-9407.	Same as Originating Activity	Continuous	489
IR514	114 FW (ANG), Joe Foss Field, Sioux Falls, SD 57104-0264 DSN 798-7754/46, C605-9	Same as Originating Activity	Daylight hours, Tue-Sat, OT by NOTAM	303
IR518	114 FW (ANG), Joe Foss Field, Sioux Falls, SD 57104-0264 DSN 798-7745, C605-988-	114 FW (ANG), Joe Foss Field, Sioux Falls, SD 57104-0264 DSN 798-7754/7746, C605	Daylight hours, Mon-Sat, OT by NOTAM	323
IR526	DET 1, 184 IW, Smoky Hill ANG Range, 8429 W Farrelly Rd, Salina, KS 67401-9407.	Same as Originating Activity	Continuous	455
IR592	188th Wing - AR ANG, 4850 Leigh Ave., Fort Smith, AR 72903 DSN 778-5502, C479-57	Same as Originating Activity.	Continuous	702
IR605	148 FW (ANG), Duluth Intl., MN 55811 DSN 825-7370.	Same as Originating Activity	Daily 1400-0500Z++, available OT	200
IR606	148 FW (ANG), Duluth Intl., MN 55811 DSN 825-7370.	Same as Originating Activity	Daily 1400-0500Z++, available OT	200
IR608	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0400Z++ Mon-Fri, weekends by NOTAM	327
IR609	5 OSS/OSTC, 300 Summit Dr., Minot AFB, ND 58705-5044 DSN 453-2967, C701-723-2967	23 BS/DOS, 300 Summit Dr., Minot AFB, ND 58705 DSN 453-2002/3527, C701-723-2002.	Continuous	965
IR610	5 OSS/OSTC, 300 Summit Dr., Minot AFB, ND 58705-5044 DSN 453-2967, C701-723-2967	23 BS/DOS, 300 Summit Dr., Minot AFB, ND 58705 DSN 453-2002/3527, C701-723-2002/	Continuous	1124
IR613	114 FW (ANG), Joe Foss Field, Sioux Falls, SD 57104-0264 DSN 798-7754/46, C605-9	Same as Originating Activity	Daylight hours, Tue-Sat, OT by NOTAM	324
IR618	JFAC-IN/DET 1, Atterbury ANG Range, Bldg 124, Camp Atterbury, IN 46124 DSN 569-2	Same as Originating Activity	Sunrise-Sunset, Tue-Sun, OT by NOTAM	172
IR644	5 OSS/OSTC, 300 Summit Dr., Minot AFB, ND 58705-5044 DSN 453-2967, C701-723-2967	23 BS/DOS, 300 Summit Dr., Minot AFB, ND 58705 DSN 453-2639/3527, C701-723-2639/	Continuous	891
IR649	5 OSS/OSTC, 300 Summit Dr., Minot AFB, ND 58705-5044 DSN 453-2967, C701-723-2967	23 BS/DOS, 300 Summit Dr., Minot AFB, ND 58705 DSN 453-2639/3527, C701-723-2639/	Continuous	274
IR654	5 OSS/OSTC, 300 Summit Dr., Minot AFB, ND 58705-5044 DSN 453-2967, C701-723-2967	23 BS/DOS, 300 Summit Dr., Minot AFB, ND 58705 DSN 453-2002/3527, C701-723-2002/	Continuous	1237
IR655	5 OSS/OSTC, 300 Summit Dr., Minot AFB, ND 58705-5044 DSN 453-2967, C701-723-2967	23 BS/DOS, 300 Summit Dr., Minot AFB, ND 58705 DSN 453-2002/3527, C701-723-2002/	Continuous	2056
IR656	5 OSS/OSTC, 300 Summit Dr., Minot AFB, ND 58705-5044 DSN 453-2967, C701-723-2967	23 BS/DOS, 300 Summit Dr., Minot AFB, ND 58705 DSN 453-2002/3527, C701-723-2002/	Continuous	1622
IR678	5 OSS/A-3C, 300 Summit Dr., Minot AFB, ND 58705-5044 DSN 453-2967, C701-723-2967	23 BS/DOS, 300 Summit Dr., Minot AFB, ND 58705-5044 DSN 453-2002/3527, C701-723-	Continuous	784
IR714	COMSTRKFIGHTWINGLANT, Oceana NAS, Virginia Beach, VA 23460 DSN 433-9141, C757-43	FACSFAC VACAPES, Oceana NAS, Virginia Beach, VA 23460 DSN 433-1228, C757-433-122	Continuous	426

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
IR715	COMSTRKFIGHTWINGLANT, Oceana NAS, Virginia Beach, VA 23460 DSN 433-9521, C757-43	FACSFAC VACAPES, Oceana NAS, Virginia Beach, VA 23460 DSN 433-1228, C757-433-122	Continuous	500
IR718	COMSTRKFIGHTWINGLANT, Oceana NAS, Virginia Beach, VA 23460 DSN 433-9521, C757-43	FACSFAC VACAPES, Oceana NAS, Virginia Beach, VA 23460 DSN 433-1228, C757-433-122	Continuous	602
IR719	CSFWL, Oceana NAS, Virginia Beach, VA 23460 DSN 433-9696, C757-433-9696.	FACSFAC VACAPES, Oceana NAS, Virginia Beach, VA 23460 DSN 433-1228, C757-433-122	Continuous	528
IR720	COMSTRKFIGHTWINGLANT, Oceana NAS, Virginia Beach, VA 23460 DSN 433-9141, C757-43	FACSFAC VACAPES, Oceana NAS, Virginia Beach, VA 23460 DSN 433-1228, C757-433-122	Continuous	515
IR721	437 OSS/OSO, Joint Base Charleston, SC 29404 DSN 673-5554, C843-963-5554.	437 OSS/OSO, Joint Base Charleston, SC 29404 DSN 673-5554, C843-963-5554.	Continuous	245
IR723	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0400Z++ Mon-Fri, occasionally weekends	329
IR726	4 OSS/OSOR, Seymour Johnson AFB, NC 27531-5004 DSN 722-2672, C919-722-2672.	4 OSS/OSOS, Seymour Johnson AFB, NC 27531-5004 Duty hrs DSN 722-2129/2124, C919-	Continuous	179
IR743	COMSTRKFIGHTWINGLANT, Oceana NAS, Virginia Beach, VA 23460 DSN 433-9141, C 757-4	FACSFAC VACAPES, Oceana NAS, Virginia Beach, VA 23460 DSN 433-1228, C757-433-122	Continuous	178
IR760	COMSTRKFIGHTWINGLANT, Oceana NAS, Virginia Beach, VA 23460 DSN 433-9141, C757-43	FACSFAC VACAPES, Oceana NAS, Virginia Beach, VA 23460 DSN 433-1228, C757-433-122	Continuous	460
IR761	COMSTRKFIGHTWINGLANT, Oceana NAS, Virginia Beach, VA 23460 DSN 433-9141, C757-43	FACSFAC VACAPES, Oceana NAS, Virginia Beach, VA 23460 DSN 433-1228, C757-433-122	Continuous	408
IR762	COMSTRKFIGHTWINGLANT, Oceana NAS, Virginia Beach, VA 23460 DSN 433-9141, C757-43	FACSFAC VACAPES, Oceana NAS, Virginia Beach, VA 23460 DSN 433-1228, C757-433-122	Continuous	415
IR800	Eastern Air Defense (EADS) DSN 587-6247/6313.	Same as Originating Activity	Continuous	1086
IR801	174 FW, Det 1, Ft. Drum, NY 13608 DSN 772-5990/2835, C314-772-5990.	Same as Originating Activity	Continuous	710
IR850	Commander, Naval Air Warfare Center, NAWS, Pt. Mugu, CA 93042-5008 DSN 351-7113,	Commander, Naval Air Warfare Center, NAWS, Pt. Mugu, CA 93042-5008 DSN 351-7545,	Sunrise-Sunset by NOTAM	524
IR851	Commander, Naval Air Warfare Center, NAWS, Pt. Mugu, CA 93042-5008 DSN 351-7113,	Commander, Naval Air Warfare Center Weapons Division, Code 52911GE, NAWS, Pt. Mu	Daily Sunrise-Sunset	555
IR852	Commander, Naval Air Warfare Center, NAWS, Pt. Mugu, CA 93042-5008 DSN 351-7113,	Commander, Naval Air Warfare Center Weapons Division, Code 52911GE, NAWS, Pt. Mu	Sunrise-Sunset	281
IR900	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	454
IR901	611 AOC/CODK, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-	3 OSS/OSOS, 8364 Kuter Ave., Elmendorf AFB, AK 99706 DSN 317-552-2406, C907-552-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	316
IR902	611 AOC/CODK, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506 DSN 317-552-5715/	3 OSS/OSOS, 8364 Kuter Ave, Elmendorf AFB, AK 99506 DSN 317-552-2406, C907-552-2	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	510

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
IR903	611 AOC/CODK, 9480 Pease Ave. Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552	3 OSS/OSOS, 8364 Kuter Ave., Elmendorf AFB, AK 99506 DSN 317-552-2406, C907-552-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	396
IR905	611 AOC/CODK, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506 DSN 317-552-5715/	3 OSS/OSOS, 8364 Kuter Ave., Elmendorf AFB, AK 99706 DSN 317-552-2406, C907-552-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	636
IR909	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	174
IR911	611 AOC/CODK, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-	3 OSS/OSOS, 8364 Kuter Ave, Elmendorf AFB, AK 99706 DSN 317-552-2406, C907-552-2	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	316
IR912	611 AOC/CODK, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-	3 OSS/OSOS, 8364 Kuter Ave., Elmendorf AFB, AK 99506 DSN 317-552-2406, C907-552-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	618
IR913	611 AOC/CODK, 9480 Pease Ave Ste 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-5	3 OSS/OSOS, 8364 Kuter Ave., Elmendorf AFB, AK 99506 DSN 317-552-2406, C907-552-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	396
IR915	611 AOC/CODK, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-	3 OSS/OSOS, 8364 Kuter Ave., Elmendorf AFB, AK 99706 DSN 317-552-2406, C907-552-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	636
IR916	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	454
IR917	611 AOC/CODK, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	281
IR918	611 AOC/CODK, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	281
IR919	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	603
IR921	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	499
IR922	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	598
IR923	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	541
IR939	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	174
IR952	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	1590
IR953	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	1076
IR983	PACAF/DOCS, 25 E ST, SUITE I232, HICKAM AFB, HI 96853-5426 DSN 449-4173.	MARIANAS ISLANDS RANGE CONTROL DSN (315)-349-6399, C671-488-8104.	Continuous	586
SR038	Base Operations, Lawson AAF, Fort Benning, GA. DSN 835-3524/2471 C706-545-3524/2	Same as Originating Activity	Continuous	187
SR039	Base Operations, Lawson AAF, Fort Benning, Ga. DSN 835-3524/2471 C706-545-3524/2	Same as Originating Activity	Continuous	112

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
SR040	94/OSS Dobbins AFB, GA 30069-5009 DSN 625-2478, C678-655-2478.	Same as Originating Activity	1200-0300Z ++	128
SR069	908 OSF/DOO, 430 W Maxwell Blvd, Bldg 1050, Maxwell AFB, AL 36112-6591 DSN 493-7	Same as Originating Activity	1400-0400Z++	147
SR070	908 OSF/DOO, 430 W Maxwell Blvd, Bldg 1050, Maxwell AFB, AL 36112-6591 DSN 493-7	Same as Originating Activity	1400-0400Z++	184
SR071	908 OSF/DOO, 430 W Maxwell Blvd, Bldg 1050, Maxwell AFB, AL 36112-6591 DSN 493-7	Same as Originating Activity	1300-0500Z++	178
SR072	908 OSF/DOO, 430 W Maxwell Blvd, Bldg 1050, Maxwell AFB, AL 36112-6591 DSN 493-7	Same as Originating Activity	1300-0500Z++	184
SR1001	3 OSS/DOH, 10460 L Street, Elmendorf AFB, AK 99506-2670 DSN 317-552-4658, C907-5	3 OSS/DOTS, DSN 317-552-3457, C907-552-3457.	Continuous	363
SR1002	3 OSS/DOH, 10460 L Street, Elmendorf AFB, AK 99506-2670 DSN 317-552-4658, C907-5	3 OSS/DOTS, DSN 317-552-3457, C907-552-3457.	Continuous	161
SR1003	3 OSS/DOH, 10460 L Street, Elmendorf AFB, AK 99506-2670 DSN 317-552-4658, C907-5	3 OSS/DOTS, DSN 317-552-3457, C907-552-3457.	Continuous	230
SR1004	3 OSS/DOH, 10460 L Street, Elmendorf AFB, AK 99506-2670 DSN 317-552-4658, C907-5	3 OSS/DOTS, DSN 317-552-3457, C907-552-3457.	Continuous	160
SR1005	3 OSS/DOH, 10460 L Street, Elmendorf AFB, AK 99506-2670 DSN 317-552-4658, C907-5	3 OSS/DOTS, DSN 317-552-3457, C907-552-3457.	Continuous	292
SR1006	3 OSS/DOH, 10460 L Street, Elmendorf AFB, AK 99506-2670 DSN 317-552-4658, C907-5	3 OSS/DOTS, DSN 317-552-3457, C907-552-3457.	Continuous	111
SR1007	3 OSS/DOH, 10460 L Street, Elmendorf AFB, AK 99506-2670 DSN 317-552-4658, C907-5	3 OSS/DOTS, DSN 317-552-3457, C907-552-3457.	Continuous	149
SR1008	3 OSS/DOH, 10460 L Street, Elmendorf AFB, AK 99506-2670 DSN 317-552-4658, C907-5	3 OSS/DOTS, DSN 317-552-3457, C907-552-3457.	Continuous	231
SR1009	3 OSS/DOH, 10460 L Street, Elmendorf AFB, AK 99506-2670 DSN 317-552-4658, C907-5	3 OSS/DOTS, DSN 317-552-3457, C907-552-3457.	Continuous	383
SR101	1 SOAOS/DOGR, Hurlburt Field, FL 32544 DSN 579-7812/7813, C850-884-7812/7813.	Same as Originating Activity	Continuous	1087
SR1010	3 OSS/DOH, 10460 L Street, Elmendorf AFB, AK 99506-2670 DSN 317-552-4658, C907-5	3 OSS/DOTS, DSN 317-552-3457, C907-552-3457.	Continuous	310
SR102	1 SOAOS/DOGR, Hurlburt Field, FL 32544 DSN 579-7812/7813, C850-884-7812/7813.	Same as Originating Activity	Continuous	347
SR103	1 SOAOS/DOGR, Hurlburt Field, FL 32544 DSN 579-7812/7813, C850-884-7812/7813.	Same as Originating Activity	Continuous	506
SR104	1 SOAOS/DOGR, Hurlburt Field, FL 32544 DSN 579-7812/7813, C850-884-7812/7813.	Same as Originating Activity	Continuous	980
SR105	1 SOAOS/DOGR, Hurlburt Field, FL 32544 DSN 579-7812/7813, C850-884-7812/7813.	Same as Originating Activity	Continuous	278
SR106	1 SOAOS/DOGR, Hurlburt Field, FL 32544 DSN 579-7812/7813, C850-884-7812/7813.	Same as Originating Activity	Continuous	499
SR119	1 SOAOS/DOGR, Hurlburt Field, FL 32544 DSN 579-7812/7813, C850-884-7812/7813.	Same as Originating Activity	Continuous	956
SR130	12 OSS/OSOA, 501 I Street East, Randolph AFB, TX 78150 C210-652-5580, DSN 487-55	559 FTS, Randolph AFB, TX 78150 C210-652-5661, DSN 487-5661.	Sunrise-Sunset daily, except holidays	126
SR137	14 OSS/OSOP, Columbus AFB, MS 39710-5000 DSN 742-7560/7633, C662-434-7560/7633.	37/41 FTS, Columbus AFB, MS 39710-5000 DSN 742-7666/7667, C662-434-7666/7667.	SR-SS, Daily	170
SR138	14 OSS/OSOP, Columbus AFB, MS 39710 DSN 742-7560/7633, C662-434-7560/7633.	37/41 FTS, Columbus AFB, MS 39710 DSN 742-7666/7667, C662-434-7666/7667.	SR-SS, Daily	170
SR166	437 OSS/OSTA, Charleston AFB, SC 29404-5054 DSN 673-5613, C843-963-5613.	20 OSS/OSOS, Shaw AFB, SC 29152-5000 DSN 965-1118/1119, C803-895-1118/1119, FAX	Continuous	183
SR200	58 OSS/OSOA, 4301 Randolph Ave, Kirtland AFB, NM 87117-5835 DSN 263-5979/5888/57	Same as Originating Activity	Continuous	295
SR201	58 OSS/OSOA, 4301 Randolph Ave, Kirtland AFB, NM 87117-5835 DSN 263-5979/5888/57	Same as Originating Activity	Continuous	513
SR205	97 OSS/DOA, 400 N. 6th Street, Altus AFB, OK 73521 DSN 866-6098, C580-481-6098.	97 OSS/OSK 400 N. 6th Street, Suite 12, Altus AFB, OK 73521 DSN 866-7110, C580-4	0830-0230 Local Mon-Fri	107

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
SR206	97 OSS/DOA, 400 N. 6th Street, Altus AFB, OK 73521 DSN 866-6098, C580-481-6098.	97 OSS/OSK 400 N. 6th Street, Suite 12, Altus AFB, OK 73521 DSN 866-7110, C580-4	0830-0230 Local Mon-Fri	120
SR208	97 OSS/DOA, 400 N. 6th Street, Altus AFB, OK 73521 DSN 866-6098, C580-481-6098.	97 OSS/OSK, 400 N. 6th Street, Suite 12, Altus AFB, OK DSN 866-7110, C580-481-71	0830-0230 Local Mon-Fri	141
SR210	58 OSS/OSOA, 4301 Randolph Ave, Kirtland AFB, NM 87117-5835 DSN 263-5979/5888/57	Same as Originating Activity	Continuous	177
SR211	58 OSS/OSOA, 4301 Randolph Ave, Kirtland AFB, NM 87117-5835 DSN 263-5979/5888/57	Same as Originating Activity	Continuous	228
SR212	27 SOAOS/DOOA, 301 S. Chindit Ave, Bldg 790, Rm 120, Cannon AFB, NM 88103, 27.SO	27 SOAOS/DOOS, 301 S. Chindit Ave, Bldg 790, Rm 120, Cannon AFB, NM 88103, 27SOA	Continuous	282
SR213	27 SOAOS/DOOA, 301 S. Chindit Ave, Bldg 790, Rm 120, Cannon AFB, NM 88103, 27.SO	27 SOAOS/DOOS, 301 S. Chindit Ave, Bldg 790, Rm 120, Cannon AFB, NM 88103, 27SOA	Continuous	285
SR214	27 SOAOS/DOOA, 301 S. Chindit Ave, Bldg 790, Rm 120, Cannon AFB, NM 88103, 27.SO	27 SOAOS/DOOS, 301 S. Chindit Ave, Bldg 790, Rm 120, Cannon AFB, NM 88103, 27SOA	Continuous	303
SR216	97 OSS/DOA, 400 N. 6th Street, Altus AFB, OK 73521 DSN 866-6098, C580-481-6098.	97 OSS/OSK, 400 N. 6th Street, Suite 12, Altus AFB, OK 73521 DSN 866-7110, C580-	0830-0230 Local Mon-Fri	135
SR217	97 OSS/DOA, 400 N. 6th Street, Altus AFB, OK 73521 DSN 866-6098, C580-481-6098.	97 OSS/OSK, 400 N. 6th Street, Suite 12, Altus AFB, OK 73521 DSN 866-7110, C580-	0830-0230 Local Mon-Fri	139
SR218	19 OSS/OSK, 380 Chief Williams Drive, Little Rock AFB, AR 72099-4976 DSN 731-330	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-6850, C501	Continuous	307
SR219	19 OSS/OSK, 380 Chief Williams Drive, Little Rock AFB, AR 72099-4976 DSN 731-330	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-6850, C501	Continuous	250
SR220	19 OSS/OSK, 380 Chief Williams Drive, Little Rock AFB, AR 72099-4976 DSN 731-330	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-6850, C501	Continuous	219
SR221	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-3358, C501	Same as Originating Activity	Continuous	775
SR222	19 OSS/OSK, 380 Chief Williams Drive, Little Rock AFB, AR 72099-4976 DSN 731-330	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-6850, C501	Continuous	161
SR223	19 OSS/OSK, 380 Chief Williams Drive, Little Rock AFB, AR 72099-4976 DSN 731-330	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-6850, C501	Continuous	148
SR224	19 OSS/OSK, 380 Chief Williams Drive, Little Rock AFB, AR 72099-4976 DSN 731-330	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-6850, C501	Continuous	321
SR225	19 OSS/OSK, 380 Chief Williams Drive, Little Rock AFB, AR 72099-4976 DSN 731-330	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-6850, C501	Continuous	345
SR227	19 OSS/OSK, 380 Chief Williams Drive, Little Rock AFB, AR 72099-4976 DSN 731-330	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-6850, C501	Continuous	283
SR228	301 OG/SUA, NAS JRB Fort Worth, TX DSN 739-6903/6904/6905, C817-782-6903/6904/69	Same as Originating Activity	0700-2200 local; other times by NOTAM	230
SR229	19 OSS/OSK, 380 Chief Williams Drive, Little Rock AFB, AR 72099-4976 DSN 731-330	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-6850, C501	Continuous	287
SR230	19 OSS/OSK, 380 Chief Williams Drive, Little Rock AFB, AR 72099-4976 DSN 731-330	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-6850, C501	Continuous	249

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
SR231	19 OSS/OSK, 380 Chief Williams Drive, Little Rock AFB, AR 72099-4976 DSN 731-330	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-6850, C501	Continuous	337
SR232	19 OSS/OSK, 380 Chief Williams Drive, Little Rock AFB, AR 72099-4976 DSN 731-330	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-6850, C501	Continuous	226
SR233	7 WG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	242
SR234	7 WG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	150
SR235	71 OSS, 301 Gritz St., Vance AFB, OK 73705-5202 DSN 448-6276/7820 C580-213-6276/	Same as Originating Activity	Sunrise -Sunset and active days per local directives	157
SR236	317 AG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	234
SR237	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-3358, C501	Same as Originating Activity	Continuous	131
SR238	19 OSS/OSK, 380 Chief Williams Drive, Little Rock AFB, AR 72099-4976 DSN 731-330	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-6850, C501	Continuous	120
SR239	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-3358, C501	314 OSS/OSK, 380 CMSGT Williams Street, Little Rock AFB, AR 72099-4976 DSN 731-3	Continuous	172
SR240	7 WG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	158
SR241	71 OSS, 301 Gritz St., Vance AFB, OK 73705-5202 DSN 448-6276/7820 C580-213-6276/	Same as Originating Activity	Sunrise-Sunset and active days per local directives	178
SR242	317 AG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	228
SR243	7 WG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	192
SR244	317 AG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	140
SR245	7 WG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	153
SR246	19 OSS/OSK, 380 Chief Williams Drive, Little Rock AFB, AR 72099-4976 DSN 731-330	19 OSS/OSO, 320 Thomas Avenue, Little Rock AFB, AR 72099-4976 DSN 731-6850, C501	Continuous	508
SR247	71 OSS, 301 Gritz St., Vance AFB, OK 73705-5202 DSN 448-6276/7820 C580-213-6276/	Same as Originating Activity	Sunrise-Sunset and active days per local directives	178
SR248	19 OSS/OSK, 380 Chief Williams Drive, Little Rock AFB, AR 72099-4976, DSN 731-33	Same as Originating Activity	Continuous	232
SR249	7 WG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	235
SR250	317 AG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	96
SR251	7 WG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	87
SR252	19 OSS/OSK, 380 Chief Williams Drive, Little Rock AFB, AR 72099-4976, DSN 731-33	Same as Originating Activity	Continuous	186
SR253	71 OSS, 301 Gritz St., Vance AFB, OK 73705-5202 DSN 448-6276/7820 C580-213-6276/	Same as Originating Activity	Sunrise-Sunset and active days per local directives	157
SR255	7 WG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	101
SR258	317 WG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	202
SR261	317 WG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	156
SR267	7 WG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	202

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
SR270	301 OG/SUA, NAS JRB Fort Worth, TX DSN 739-6903/6904/6905, C817-782-6903/6904/69	Same as Originating Activity	0700-2200 local; other times by NOTAM	216
SR271	80 OSS/OSOA, 1911 J. Ave. Ste. 3, Sheppard AFB, TX 76311 DSN 736-0576, C940-676-	89/459 FTS, Sheppard AFB, TX 76311 DSN 736-2240, C940-676-2240.	30 minutes after Sunrise - 30 minutes prior to Sunset	207
SR272	80 OSS/OSOA, 1911 J. Ave. Ste. 3, Sheppard AFB, TX 76311 DSN 736-0576, C940-676-	89/459 FTS, Sheppard AFB, TX 76311 DSN 736-2240, C940-676-2240.	30 minutes after Sunrise - 30 minutes prior to Sunset	190
SR273	7 WG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	185
SR274	71 OSS, 301 Gritz St., Vance AFB, OK 73705-5202 DSN 448-6276/7820 C580-213-6276/	Same as Originating Activity	Sunrise to Sunset daily	203
SR275	71 OSS, 301 Gritz St., Vance AFB, OK 73705-5202 DSN 448-6276/7820 C580-213-6276/	Same as Originating Activity	Sunrise to Sunset daily	203
SR276	47 OSS/OSOR, 570 2nd Street., Suite 6, Laughlin AFB, TX 78843 DSN 732-5864, C830	86 FTS/DOS, 307 2nd Street, Laughlin AFB, TX 78843 DSN 732-5584, C830-298-5584.	Sunrise-Sunset daily	221
SR277	47 OSS/OSOR, 570 2nd Street, Suite. 6, Laughlin AFB, TX 78843 DSN 732-5864, C830	86 FTS/DOS, 307 2nd Street, Laughlin AFB, TX 78843 DSN 732-5584, C830-298-5584.	Sunrise-Sunset daily	219
SR278	80 OSS/OSOA, 1911 J. Ave. Ste. 3, Sheppard AFB, TX 76311 DSN 736-0576, C940-676-	89/459 FTS, Sheppard AFB, TX 76311 DSN 736-2240, C940-676-2240.	30 minutes after Sunrise - 30 minutes prior to Sunset	221
SR279	80 OSS/OSOA, 1911 J. Ave. Ste. 3, Sheppard AFB, TX 76311 DSN 736-0576, C940-676-	89/459 FTS, Sheppard AFB, TX 76311 DSN 736-2240, C940-676-2240.	30 minutes after Sunrise - 30 minutes prior to Sunset	203
SR280	7 WG, Dyess AFB, TX 79607 DSN 461-2318.	Same as Originating Activity	Continuous	55
SR281	47 OSS/OSOR, 570 2nd Street, Suite 6, Laughlin AFB, TX 78843 DSN 732-5864/5337,	85 FTS/DOS, 570 2nd Street, Laughlin AFB, TX 78843 DSN 732-5121/5429, C830-298-5	Sunrise-Sunset daily	177
SR282	47 OSS/OSOR, 570 2nd Street, Suite. 6, Laughlin AFB, TX 78843 DSN 732-5864/5337,	85 FTS/DOS, 570 2nd Street, Laughlin AFB, TX 78843 DSN 732-5121/5429, C830-298-5	Sunrise-Sunset daily	177
SR283	47 OSS/OSOR, 570 2nd Street, Suite 6, Laughlin AFB, TX 78843 DSN 732-5864, C830-	85 FTS/DOS, 570 2nd Street., Laughlin AFB, TX 78843 DSN 732-5121/5429, C830-298-	Sunrise-Sunset daily	154
SR284	47 OSS/OSOR, 570 2nd Street., Suite. 6, Laughlin AFB, TX 78843 DSN 732-5864, C83	85 FTS/DOS, 570 2nd Street., Laughlin AFB, TX 78843 DSN 732-5121/5429, C830-298-	Sunrise-Sunset daily	154
SR286	12 OSS/OSOA, 501 I Street East, Randolph AFB, TX 78150, DSN 487-5580, C210-652-5	559 FTS, Randolph AFB, TX 78150 DSN 487-5661, C210-652-5661.	Open Daily Sunrise-Sunset	129
SR287	12 OSS/OSOA, 501 I Street East, Randolph AFB, TX 78150, DSN 487-5580, C210-652-5	559 FTS, Randolph AFB, TX 78150 DSN 487-5661, C210-652-5661.	Sunrise-Sunset Daily, except holidays	134
SR290	12 OSS/OSOA, 501 I Street East, Randolph AFB, TX 78150, DSN 487-5580, C210-652-5	559 FTS, Randolph AFB, TX 78150, DSN 487-5661, C210-652-5661.	Sunrise-Sunset Daily, except holidays	140
SR292	12 OSS/OSOA, 501 I Street East, Randolph AFB, TX 78150, DSN 487-5580, C210-652-5	559 FTS, Randolph AFB, TX 78150 DSN 487-5661, C210-652-5661.	Sunrise-Sunset daily except holidays	131
SR294	71 FTW/OSOP, Vance AFB, OK 73705-5202 DSN 448-7820 C580-213-7820.	Same as Originating Activity	Sunrise-Sunset	243
SR295	71 FTW/OSOP, Vance AFB, OK 73705-5202 DSN 448-7820 C580-213-7820.	Same as Originating Activity	Sunrise-Sunset	237
SR296	71 FTW/OSOP, Vance AFB, OK 73705-5202 DSN 448-7820 C580-213-7820.	Same as Originating Activity	Sunrise-Sunset	217

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
SR300	60 OSS/OSO, 611 E. St., Travis AFB, CA 94535 DSN 837-1075, C707-424-1075.	60 OSS/OSO, 611 E. St., Travis AFB, CA 94535 DSN 837-5145, C707-424-5145.	Continuous	999
SR301	60 OSS/OSO, 611 E. St., Travis AFB, CA 94535 DSN 837-1075, C707-424-1075.	60 OSS/OSO, 611 E. St., Travis AFB, CA 94535 DSN 837-5145, C707-424-5145.	Continuous	1000
SR311	129 OSF/DOW, PO Box 103, Stop 14, Moffett Federal Afd, CA 94035-5000 DSN 359-93	Same as Originating Activity	Continuous	186
SR353	129 OG/OGV, 656 Jonny Luv Lane, Moffett ANGB, CA 94035, C650-603-9356, DSN359-93	129 OSS/OSA, 656 Jonny Luv Lane, Moffett ANGB, CA 94035, C650-603-9357, DSN359-9	Continuous	142
SR359	129 OSF/DOW, PO Box 103, Stop 14, Moffett Federal Afd, CA 94035-5000 DSN 359-93	Same as Originating Activity	Continuous	186
SR390	146 AW/DOXT (ANG), 106 Mulcahey Dr., Port Hueneme, CA 93041-4003 DSN 893-7590/75	Same as Originating Activity	Continuous	119
SR397	146 AW/DOXT (ANG), 106 Mulcahey Dr., Port Hueneme, CA 93041-4003 DSN 893-7590/75	Same as Originating Activity	Continuous	137
SR616	139 Airlift Wg., 705 Memorial Drive, St. Joseph, MO 64503-9307 DSN 356-3029/3260	139 AW WG/Tactics, 705 Memorial Drive, St. Joseph, MO 64503 DSN 356-3029/3260.	1300-2200Z++ daily	193
SR617	139 Airlift Wg., 705 Memorial Drive, St. Joseph, MO 64503-9307 DSN 356-3029/3260	139 AW WG/Tactics, 705 Memorial Drive, St. Joseph, MO 64503 DSN 356-3029/3260.	Continuous	192
SR618	139 Airlift Wg., 705 Memorial Drive, St. Joseph, MO 64503-9307 DSN 356-3029/3260	139 AW WG/Tactics, 705 Memorial Drive, St. Joseph, MO 64503 DSN 356-3029/3260.	1300-0500Z++ daily	167
SR619	139 Airlift Wg., 705 Memorial Drive, St. Joseph, MO 64503-9307 DSN 356-3029/3260	139 AW WG/Tactics, 705 Memorial Drive, St. Joseph, MO 64503 DSN 356-3029/3260.	1300-0500Z++ daily	177
SR701	191 AG, Selfridge ANGB, MI 48045 DSN 273-4498/4441, C810-463-3664.	Same as Originating Activity	1600-0400Z++ Tue-Sat, 1600-2200Z++ Sun	243
SR702	191 AG, Selfridge ANGB, MI 48045 DSN 273-4498/4441, C810-463-3664.	Same as Originating Activity	1600-0400Z++ Tue-Sat, 1600-2200Z++ Sun	227
SR703	191 AG, Selfridge ANGB, MI 48045 DSN 273-4498/4441, C810-463-3664.	Same as Originating Activity	1600-0400Z++ Tue-Sat, 1600-2200Z++ Sun	102
SR707	179 AW, Mansfield Lahm Airport, OH 44903-0179 DSN 696-6165.	Same as Originating Activity	0700-2300 local daily	187
SR708	179 AW, Mansfield Lahm Airport, OH 44903-0179 DSN 696-6165.	Same as Originating Activity	0700-2300 local daily	217
SR709	179 AW, Mansfield Lahm Airport, OH 44903-0179 DSN 696-6165.	Same as Originating Activity	0700-2300 local daily	139
SR710	179 AW, Mansfield Lahm Airport, OH 44903-0179 DSN 696-6165.	Same as Originating Activity	0700-2300 local daily	145
SR711	179 AW, Mansfield Lahm Airport, OH 44903-0179 DSN 696-6165.	Same as Originating Activity	0700-2300 local daily	150
SR712	179 AW, Mansfield Lahm Airport, OH 44903-0179 DSN 696-6165.	Same as Originating Activity	0700-2300 local daily	186
SR713	179 AW, Mansfield Lahm Airport, OH 44903-0179 DSN 696-6165.	Same as Originating Activity	0700-2300 local daily	154
SR714	179 AW, Mansfield Lahm Airport, OH 44903-0179 DSN 696-6165.	Same as Originating Activity	0700-2300 local daily	115
SR715	179 AW, Mansfield Lahm Airport, OH 44903-0179 DSN 696-6165.	Same as Originating Activity	0700-2300 local daily	196
SR727	133AW, Minneapolis-St. Paul Intl, MN 55111, DSN 783-2488, C612-713-2488.	Same as Originating Activity	IAW 133AW lcl sched, ctc 109AS/DOK DSN 783-2488 or 109AS/DOS DSN 783-2459	284
SR728	133AW, Minneapolis-St. Paul Intl, MN 55111, DSN 783-2488, C612-713-2488.	Same as Originating Activity	IAW 133AW lcl sched, ctc 109AS/DOK DSN 783-2488 or 109AS/DOS DSN 783-2459	249

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
SR729	133AW, Minneapolis-St. Paul Intl, MN 55111, DSN 783-2488, C612-713-2488.	Same as Originating Activity	IAW 133AW lcl sched, ctc 109AS/DOK DSN 783-2488 or 109AS/DOS DSN 783-2459	198
SR730	133AW, Minneapolis-St. Paul Intl, MN 55111, DSN 783-2488, C612-713-2488.	Same as Originating Activity	IAW 133AW lcl sched, ctc 109AS/DOK DSN 783-2488 or 109AS/DOS DSN 783-2459	192
SR731	133AW, Minneapolis-St. Paul Intl, MN 55111, DSN 783-2488, C612-713-2488.	Same as Originating Activity	IAW 133AW lcl sched, ctc 109AS/DOK DSN 783-2488 or 109AS/DOS DSN 783-2459	124
SR771	440 AW/DOO, General Mitchell IAP, Milwaukee, WI 53207, DSN 741-5155/5157, FAX DS	Same as Originating Activity	2200-0330Z++ Tue-Fri; 1500-2200Z++ Sat-Sun	351
SR776	440 AW/DOO, General Mitchell IAP, Milwaukee, WI 53207, DSN 741-5155/5157, FAX DS	Same as Originating Activity	2000-0400Z++ Tue-Fri; 1600-2200Z++ Sat-Sun	219
SR781	Alpena CRTC/OTM (ANG), 5884 A Street, Alpena MI 49707-8125 DSN 741-3509/3226 C80	Same as Originating Activity	0700-2300 local daily	168
SR782	Alpena CRTC/OTM (ANG), 5884 A Street, Alpena MI 49707-8125 DSN 741-3509/3226 C80	Same as Originating Activity	0700-2300 local daily	215
SR800	166 OSF/OSK, 2805 Spruance Drive, New Castle 19720-1615 DSN 445-7554 C302-323-35	166 AW/OSK, New Castle, DE, schedule (pri) by website https://cseaf.eglin .	0800-2300 local	201
SR801	166 OSF/OSK, 2805 Spruance Drive, New Castle 19720-1615 DSN 445-7554 C302-323-35	166 AW/OSK, New Castle, DE, schedule (pri) by website https://cseaf.eglin .	0800-2300 local	268
SR802	167 AW, Eastern West Virginia Regional, Martinsburg, WV 25401 DSN 242-5250.	Same as Originating Activity	Continuous	104
SR803	167 AW, Eastern West Virginia Regional, Martinsburg, WV 25401 DSN 242-5250.	Same as Originating Activity	Continuous	113
SR804	167 AW, Eastern West Virginia Regional, Martinsburg, WV 25401 DSN 242-5250.	Same as Originating Activity	Continuous	123
SR805	166 OSF/OSK, 2805 Spruance Drive, New Castle 19720-1615 DSN 445-7554 C302-323-35	166 AW/OSK, New Castle, DE, schedule (pri) by website https://cseaf.eglin .	0800-2300 local	202
SR806	167 AW, Eastern West Virginia Regional, Martinsburg, WV 25401 DSN 242-5250.	Same as Originating Activity	Continuous	157
SR807	167 AW, Eastern West Virginia Regional, Martinsburg, WV 25401 DSN 242-5250.	Same as Originating Activity	Continuous	182
SR808	167 AW, Eastern West Virginia Regional, Martinsburg, WV 25401 DSN 242-5250.	Same as Originating Activity	Continuous	221
SR809	CHSCW Atlantic, 610 A Street, Suite 150, Norfolk, VA 23511-4222.	FACSFAC VACAPES, 601 Ocean Blvd. Virginia Beach, VA 23460	Continuous	155
SR810	CHSCW Atlantic, 610 A Street, Suite 150, Norfolk, VA 23511-4222.	FACSFAC VACAPES, 601 Ocean Blvd. Virginia Beach, VA 23460	Continuous	180
SR811	CHSCW Atlantic, 610 A Street, Suite 150, Norfolk, VA 23511-4222.	FACSFAC VACAPES, 601 Ocean Blvd. Virginia Beach, VA 23460	Continuous	133
SR812	CHSCW Atlantic, 610 A Street, Suite 150, Norfolk, VA 23511-4222.	FACSFAC VACAPES, 601 Ocean Blvd. Virginia Beach, VA 23460	Continuous	134
SR820	166 OSF/OSK, 2805 Spruance Drive, New Castle 19720-1615 DSN 445-7554 C302-323-35	166 AW/OSK, New Castle, DE, schedule (pri) by website https://cseaf.eglin .	0900-2300 local daily	179
SR821	166 OSF/OSK, 2805 Spruance Drive, New Castle 19720-1615 DSN 445-7554 C302-323-35	166 AW/OSK, New Castle, DE, schedule (pri) by website https://cseaf.eglin .	0900-2300 local daily	163
SR822	911 AW, Pittsburgh IAP ARS, PA, 2551 Defense Ave, Coraopolis, PA 15108-4403 DSN	911 OSS/OSK, Pittsburgh IAP ARS, PA, 2551 Defense Ave, Coraopolis, PA 15108-4403	1000-0300Z Mon-Sat	163

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
SR823	914 OSF/OSK, 10460 Wagner Dr, Niagra Falls ARS, NY 14304-5010, DSN 238-3233.	Same as Originating Activity	1300-0300Z++	248
SR825	914 OSF/OSK, 10460 Wagner Dr, Niagra Falls ARS, NY 14304-5010, DSN 238-3233.	Same as Originating Activity	1300-0300Z++	247
SR835	166 OSF/OSK, 2805 Spruance Drive, New Castle 19720-1615 DSN 445-7554 C302-323-35	Same as Originating Activity	0900-2300 local	168
SR844	166 OSF/OSK, 2805 Spruance Drive, New Castle 19720-1615 DSN 445-7554 C302-323-35	166 AW/OSK, New Castle, DE, schedule (pri) by website https://cseaf.eglin .	0800-2359 local	198
SR845	166 OSF/OSK, 2805 Spruance Drive, New Castle 19720-1615 DSN 445-7554 C302-323-35	166 AW/OSK, New Castle, DE, schedule (pri) by website https://cseaf.eglin .	0800-2359 local	258
SR846	166 OSF/OSK, 2805 Spruance Drive, New Castle 19720-1615 DSN 445-7554 C302-323-35	166 AW/OSK, New Castle, DE, schedule (pri) by website https://cseaf.eglin .	0800-2359 local	144
SR847	166 OSF/OSK, 2805 Spruance Drive, New Castle 19720-1615 DSN 445-7554 C302-323-35	166 AW/OSK, New Castle, DE, schedule (pri) by website https://cseaf.eglin .	0800-2359 local	86
SR867	Commander, Ft Pickett, VA 23824-5000 DSN 438-8506, C804-292-8506.	Same as Originating Activity	Continuous	246
SR871	130 AG (ANG), Kanawha County, Charleston, WV 25311 DSN 366-6291.	Same as Originating Activity	0800-2300 local	191
SR872	130 AG (ANG), Kanawha County, Charleston, WV 25311 DSN 366-6291.	Same as Originating Activity	0800-2300 Local	200
SR873	130 AG (ANG), Kanawha County, Charleston, WV 25311 DSN 366-6291.	Same as Originating Activity	0800-2300 local	198
SR874	130 AG (ANG), Kanawha County, Charleston, WV 25311 DSN 366-6291.	Same as Originating Activity	0800-2300 local	166
SR900	106 RQW/Operations, 150 Old Riverhead Rd, Westhampton Beach, NY 11978-1201 DSN 4	Same as Originating Activity	1200-0400Z++ Daily	206
SR901	106 RQW/Operations, 150 Old Riverhead Rd, Westhampton Beach, NY 11978-1201 DSN 4	Same as Originating Activity	1200-0400Z++ Daily	131
SR902	106 RQW/Operations, 150 Old Riverhead Rd, Westhampton Beach, NY 11978-1201 DSN 4	Same as Originating Activity	1200-0400Z++ Daily	218
SR904	106 RQW/Operations, 150 Old Riverhead Rd, Westhampton Beach, NY 11978-1201 DSN 4	Same as Originating Activity	1000-2200 local	246
SR905	106 RQW/Operations, 150 Old Riverhead Rd, Westhampton Beach, NY 11978-1201 DSN 4	Same as Originating Activity	1000-2200 local	131
VR025	Marine Corps Station Beaufort, Townsend Bombing Range, 9177 GA Hwy 57, Townsend,	Same as Originating Activity.	0700-2200 LCL, other times by NOTAM	64
VR041	4 OSS/OSOR, Seymour Johnson AFB, NC 27531-5004 DSN 722-2672, C919-722-2672.	4 OSS/OSOS, Seymour Johnson AFB, NC 27531-5004 DSN 722-2129/2124, C919-722-2129/	Continuous	569
VR042	4 OSS/OSOR, Seymour Johnson AFB, NC 27531-5004 DSN 722-2672, C919-722-2672.	4 OSS/OSOS, Seymour Johnson AFB, NC 27531-5004 DSN 722-2129/2124, C919-722-2129/	Continuous	627
VR043	4 OSS/OSOR, Seymour Johnson AFB, NC 27531-5004 DSN 722-2672, C919-722-2672.	4 OSS/OSOS, Seymour Johnson AFB, NC 27531-5004 DSN 722-2129/2124, C919-722-2129/	Continuous	463
VR045	Marine Corps Station Beaufort, Townsend Bombing Range, 9177 GA Hwy 57, Townsend,	Same as Origination Activity	0700-2200 LCL, Mon-Fri, other time by NOTAM	64
VR054	COMSTRKFIGHTWINGLANT, Oceana NAS, Virginia Beach, VA 23460 DSN 433-9141, C 757-4	FACSFAC VACAPES, Oceana NAS, Virginia Beach, VA 23460 DSN 433-1228, C757-433-122	0700-2100 local Mon-Fri, OT by NOTAM	41
VR058	20 OSS/OSOA, Shaw AFB, SC 29152 DSN 965-1121/1122, C803-895-1121/1122, Fax DSN 9	20 OSS/OSOS, Shaw AFB, SC 29152 DSN 965-1118/1119, C803-895-1118/1119.	Continuous (Jan, Mar, May, Jul, Sep, Nov) VR-092 reverse direction other months	244
VR060	187 FW, 5187 Selma Highway , Montgomery, AL 36108-4824 DSN 358-9255, C334-394-72	Same as Originating Activity	0700-1700 Local or by NOTAM	145

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
VR071	COMSTRKFIGHTWINGLANT, Oceana NAS, Virginia Beach, VA 23460 DSN 433-9141, C 757-4	FACSFAC VACAPES, Oceana NAS, Virginia Beach, VA 23460 DSN 433-1228, C757-433-122	0700-2100 local Mon-Fri, OT by NOTAM	36
VR073	4 OSS/OSOR, Seymour Johnson AFB, NC 27531-5004 DSN 722-2672, C919-722-2672.	4 OSS/OSOS, Seymour Johnson AFB, NC 27531-5004 DSN 722-2129/2124, C919-722-2129/	Continuous	274
VR083	4 OSS/OSOR, Seymour Johnson AFB, NC 27531-5004 DSN 722-2672, C919-722-2672	4 OSS/OSOS, Seymour Johnson AFB, NC 27531-5004 DSN 722-2129/2124, C919-722-2129/	Continuous	294
VR084	4 OSS/OSOR, Seymour Johnson AFB, NC 27531-5004 DSN 722-2672, C919-722-2672.	4 OSS/OSOS, Seymour Johnson AFB, NC 27531-5004 DSN 722-2129/2124, C919-722-2129/	Continuous	249
VR085	4 OSS/OSOR, Seymour Johnson AFB, NC 27531-5004 DSN 722-2672, C919-722-2672.	4 OSS/OSOS, Seymour Johnson AFB, NC 27531-5004 DSN 722-2129/2124, C919-722-2129/	Continuous	208
VR086	4 OSS/OSOR, Seymour Johnson AFB, NC 27531-5004 DSN 722-2672, C919-722-2672.	4 OSS/OSOS, Seymour Johnson AFB, NC 27531-5004 DSN 722-2129/2124, C919-722-2129/	Continuous	251
VR087	4 OSS/OSOR, Seymour Johnson AFB, NC 27531-5004 DSN 722-2672, C919-722-2672.	4 OSS/OSOS, Seymour Johnson AFB, NC 27531-5004 DSN 722-2129/2124, C919-722-2129/	Continuous	224
VR088	4 OSS/OSOR, Seymour Johnson AFB, NC 27531-5004 DSN 722-2672, C919-722-2672.	4 OSS/OSOS, Seymour Johnson AFB, NC 27531-5004 DSN 722-2129/2124, C919-722-2129/	Continuous	197
VR092	20 OSS/OSOA, Shaw AFB, SC 29152 DSN 965-1121/1122, C803-895-1121/1122, Fax DSN 9	20 OSS/OSOS, Shaw AFB, SC 29152 Duty hrs DSN 965-1118/1119, C803-895-1118/1119.	Continuous (Feb, Apr, Jun, Aug, Oct, Dec) VR-058 opposite direction other months	244
VR093	4 OSS/OSOR, Seymour Johnson AFB, NC 27531-5004 DSN 722-2672, C919-722-2672.	4 OSS/OSOS, Seymour Johnson AFB, NC 27531-5004 Duty hrs DSN 722-2129/2124, C919-	Continuous	262
VR096	4 OSS/OSOR, Seymour Johnson AFB, NC 27531-5004 DSN 722-2672, C919-722-2672.	4 OSS/OSOS, Seymour Johnson AFB, NC 27531-5004 DSN 722-2129/2124, C919-722-2129/	Continuous	182
VR097	20 OSS/OSOA, Shaw AFB, SC 29152 DSN 965-1121/1122, C803-895-1121/1122, Fax DSN 9	20 OSS/OSOS, Shaw AFB, SC 29152, Duty hrs DSN 965-1118/1119, C803-895-1118/1119.	0600-2400 local daily	410
VR100	27 SOAOS/DOOA, 301 S. Chindit Ave., Building 790, Rm 120 Cannon AFB, NM 88103 DS	27 SOAOS/DOOS, 301 S. Chindit Ave., Building 790, Rm 111 Cannon AFB, NM 88103 DS	Continuous	384
VR1001	FACSFACJAX, P.O. Box 40, NAS Jacksonville, FL 32212-0040 DSN 942-2004/2005, C904	Same as Originating Activity	Continuous	453
VR1002	FACSFACJAX, NAS Jacksonville, FL 32212 DSN 942-2004/2005, C904-542-2004/2005.	Same as Originating Activity	Continuous	503
VR1003	FACSFACJAX, NAS Jacksonville, FL 32212 DSN 942-2004/2005, C904-542-2004/2005.	Same as Originating Activity	Continuous	567
VR1004	FACSFACJAX, P.O. Box 40, NAS Jacksonville, FL 32212-0040 DSN 942-2004/2005, C904	Same as Originating Activity	Continuous	673
VR1005	FACSFACJAX, P.O. Box 40, NAS Jacksonville, FL 32212-0040 DSN 942-2004/2005, C904	Same as Originating Activity	Continuous	323
VR1006	FACSFACJAX, NAS Jacksonville, FL 32212 DSN 942-2004/2005, C904-542-2004/2005.	Same as Originating Activity	Continuous	776
VR1007	FACSFACJAX, P.O. Box 40, NAS Jacksonville, FL 32212-0040 DSN 942-2004/2005, C904	Same as Originating Activity	Continuous	198
VR1008	FACSFACJAX, P.O. Box 40, NAS Jacksonville, FL 32212-0040 DSN 942-2004/2005, C904	Same as Originating Activity	Continuous	85
VR1009	FACSFACJAX, P.O. Box 40, NAS Jacksonville, FL 32212-0040 DSN 942-2004/2005, C904	Same as Originating Activity	Continuous	87
VR101	301 OG/SUA, NAS JRB, Fort Worth, TX 76127 DSN 739-6903/04/05, C817-782-6903/04/0	Same as Originating Activity	0700-2200 local, OT by NOTAM	84

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
VR1010	FACSFACJAX, P.O. Box 40, NAS Jacksonville, FL 32212-0040 DSN 942-2004/2005, C904	Same as Originating Activity	Continuous	29
VR1013	FACSFACJAX, P.O. Box 40, NAS Jacksonville, FL 32212-0040 DSN 942-2004/2005, C904	Same as Originating Activity	Continuous	74
VR1014	14 OSS/OSOP, Columbus AFB, MS 39710-5000 DSN 742-2764, C662-434-2764.	37/41 FTS, Columbus AFB, MS 39710-5000 DSN 742-7666/7667, C662-434-7666/7667.	Sunrise-Sunset daily	213
VR1017	187 FW, 5187 Selma Highway, Montgomery, AL 36108-4824 DSN 358-9255, C334-394-725	Same as Originating Activity	0700-1730 local, OT by NOTAM	204
VR1020	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0400Z++ weekdays, occasional weekends	172
VR1021	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0400Z++ weekdays, occasional weekends	492
VR1022	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0400Z++ weekdays, occasional weekends	202
VR1023	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0400Z++ weekdays, occasional weekends	349
VR1024	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0400Z++ weekdays, occasional weekends	347
VR1030	COMTRAWING ONE, NAS MERIDIAN, MS 39309-0136 DSN 637-2487, C601-679-2487.	Same as Originating Activity	1100-0600Z++ daily	301
VR1031	COMTRAWING ONE, NAS MERIDIAN, MS 39309-0136 DSN 637-2487, C601-679-2487.	Same as Originating Activity	1100-0600Z++ daily	406
VR1032	COMTRAWING ONE, NAS MERIDIAN, MS 39309 DSN 637-2487, C601-679-2487.	Same as Originating Activity	1100-0600Z++ daily	252
VR1033	COMTRAWING ONE, NAS MERIDIAN, MS 39309 DSN 637-2854, C601-679-2854.	Same as Originating Activity	1100-0600Z++ daily	382
VR1039	FACSFACJAX, P.O. Box 40, NAS Jacksonville, FL 32212-0040 DSN 942-2004/2005, C904	Same as Originating Activity	Continuous	9
VR104	301 OG/SUA, NAS JRB, Fort Worth, TX 76127 DSN 739-6903/04/05, C817-782-6903/04/0	Same as Originating Activity	0700-2200 local, OT by NOTAM	267
VR1040	CO MCAS CHERRY POINT, ATTN DIROPS/RMD, Cherry Point, NC 28533 DSN 582-4040/4041,	Range Management Department, Mission Coordination/Future Operations, MCAS Cherry	Continuous	498
VR1041	CO MCAS CHERRY POINT, ATTN DIROPS/RMD, Cherry Point, NC 28533 DSN 582-4040/4041,	Range Management Department, Mission Coordination/Future Operations, MCAS Cherry	Continuous	451
VR1043	CO MCAS CHERRY POINT, ATTN DIROPS/RMD, Cherry Point, NC 28533 DSN 582-4040/4041,	Range Management Department, Mission Coordination/Future Operations, MCAS Cherry	0700-2300 Local Daily	550
VR1046	CO MCAS CHERRY POINT, ATTN DIROPS/RMD, Cherry Point, NC 28533 DSN 582-4040/4041,	Range Management Department, Mission Coordination/Future Operations, MCAS Cherry	0600-1800 Local Mon-Fri	298
VR1050	14 OSS/OSOP, Columbus AFB, MS 39710-5000 DSN 742-2764, C662-434-2764.	48 FTS, Columbus AFB, MS 39710-5000 DSN 742-7840/7847, C662-434-7840/7847.	0700-2300 local daily	435
VR1051	14 OSS/OSOP, Columbus AFB, MS 39710-5000 DSN 742-2764, C662-434-2764.	48 FTS, Columbus AFB, MS 39710-5000 DSN 742-7840, C662-434-3011/1221.	Dawn-Dusk Mon-Fri	537
VR1052	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0500Z++	434
VR1054	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1300-0500Z++ daily	347

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
VR1055	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1300-0500Z++ 7 days a week	359
VR1056	Training Air Wing Six, Pensacola, FL 32508-5509 DSN 459-2875, C850-452-2875.	NAS Pensacola, Pensacola, FL 32508-5217 DSN 459-2735, C850-452-2735.	1200-0500Z++	434
VR1059	20 OSS/OSOA, Shaw AFB, SC 29152 DSN 965-1121/1122, C803-895-1121/1122, Fax DSN 9	20 OSS/OSOS, Shaw AFB, SC 29152 Duty hrs DSN 965-1118/1119, C803-895-1118/1119.	Continuous	393
VR106	97 OSS/DOA, 101 S Sixth St., Bdg 225, Altus AFB, OK 73521 DSN 866-6098, C580-481	97 OSS/OSK, 101 S Sixth St., Bdg 225, Altus AFB, OK 73521 DSN 866-7422/1375/7490	0830-0230 local Mon-Fri	173
VR1061	COMSTRKFIGHTWINGLANT, Oceana NAS, Virginia Beach, VA 23460 DSN 433-9141, C 757-4	FACSFAC VACAPES, Oceana NAS, Virginia Beach, VA 23460 DSN 433-1228, C757-433-122	Continuous	186
VR1065	347 OSS/OSOS, Moody AFB, GA 31699-1899 DSN 460-4544/3531, C229-257-4544/3531.	23 OSS/OSOS, Moody AFB, GA 31699-1899 DSN 460-7831/7839 C229-257-7831/7839. Mon-	0700-2400L daily	189
VR1066	347 OSS/OSKA, Moody AFB, GA 31699-1899 DSN 460-4131, C229-257-4131.	23 OSS/OSOS, Moody AFB, GA 31699-1899 DSN 460-7831/7839, C229-257-7831/7839. Mon	0700-0000 local daily	242
VR1070	187 FW, 5187 Selma Highway, Montgomery, AL 36108-4824 DSN 358-9255 C334-394-7255	Same as Originating Activity	0700-2000 local, OT by NOTAM	116
VR1072	14 OSS/OSOP, 144 Liberty St. Suite 22 Bldg 230, Columbus AFB, MS 39710 DSN 742-3	48 FTS, Columbus AFB, MS 39710 DSN 742-7840, C662-434-7840.	Dawn-Dusk Mon-Fri	281
VR1076	156 AW (PRANG) Muniz ANGB, 200 Jose A. (Tony) Santana Ave., Carolina, Puerto Ric	Same as Originating Activity	1100-0000Z++ (DAILY)	123
VR1077	156 AW (PRANG) Muniz ANGB, 200 Jose A. (Tony) Santana Ave., Carolina, Puerto Ric	Same as Originating Activity	1100-0000Z++ (DAILY)	207
VR1078	156 AW (PRANG) Muniz ANGB, 200 Jose A. (Tony) Santana Ave., Carolina, Puerto Ric	Same as Originating Activity	1100-0000Z++ (DAILY)	258
VR1079	156 AW (PRANG) Muniz ANGB, 200 Jose A. (Tony) Santana Ave., Carolina, Puerto Ric	Same as Originating Activity	1100-0000Z++(DAILY)	219
VR108	27 SOAOS/DOOA, 301 S. Chindit Ave., Building 790, Rm 120 Cannon AFB, NM 88103 DS	27 SOAOS/DOOS, 301 S. Chindit Ave., Building 790, Rm 111 Cannon AFB, NM 88103 DS	Continuous	291
VR1080	156 AW (PRANG) Muniz ANGB, 200 Jose A. (Tony) Santana Ave., Carolina, Puerto Ric	Same as Originating Activity	1100-0000Z++ (DAILY)	123
VR1081	156 AW (PRANG) Muniz ANGB, 200 Jose A. (Tony) Santana Ave., Carolina, Puerto Ric	Same as Originating Activity	1100-0000Z++ (DAILY)	186
VR1082	96 OSS/OSO, 505 North Barrancas Ave, Suite 213, Eglin AFB, FL 32542-6818 DSN 872	96 OSS/OSOS (JTTOCC), 505 North Barrancas Ave, Suite 201, Eglin AFB, FL 32542-68	Continuous	256
VR1083	USAFAWC-79 Test and Evaluation Group/CD, Eglin AFB, FL 32542 DSN 872-2024, C904-	85 Test and Evaluation Squadron/DOOS, Eglin AFB, FL 32542 DSN 872-2622, C904-882	Normally 1200-2300Z++ Mon-Fri, route usage is allowable OT	244
VR1084	USAFAWC-79 Test and Evaluation Group/CD, Eglin AFB, FL 32542 DSN 872-2024, C904-	85 Test and Evaluation Squadron/DOOS, Eglin AFB, FL 32542 DSN 872-2622, C904-882	Normally 1200-2300Z++ Mon-Fri, route usage is allowable OT	118
VR1085	96 OSS/OSO, 505 North Barrancas Ave, Suite 213, Eglin AFB, FL 32542-6818 DSN 872	96 OSS/OSOS (JTTOCC), 505 North Barrancas Ave, Suite 201, Eglin AFB, FL 32542-68	Continuous	336
VR1087	347 Rescue Wing, Detachment 1/RO, 8707 North Golf Course St., MacDill AFB, FL 33	347 Rescue Wing, Detachment 1/ROA, 8707 North Golf Course St., MacDill AFB, FL 3	Normally 0900-2400Z++ daily, available OT	100
VR1088	347 Rescue Wing, Detachment 1/RO, 8707 North Golf Course St., MacDill AFB, FL 33	347 Rescue Wing, Detachment 1/ROA, 8707 North Golf Course St., MacDill AFB, FL 3	Normally 0900-2400Z++ daily, available OT	93

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
VR1089	347 Rescue Wing, Detachment 1/RO, 8707 North Golf Course St., MacDill AFB, FL 33	347 Rescue Wing, Detachment 1/ROA, 8707 North Golf Course St., MacDill AFB, FL 3	Normally 0900-2400Z++ daily, available OT	121
VR1097	347 WG, Detachment 1/RO, 8707 North Golf Course St., MacDill AFB, FL 33621-5205	347 WG, Detachment 1/ROA, 8707 North Golf Course St., MacDill AFB, FL 33621-5205	Continuous	78
VR1098	347th Rescue WG, Detachment 1/RO, 8707 North Golf Course St., MacDill AFB, FL 33	347th Rescue WG, Detachment 1/ROA, 8707 North Golf Course St., MacDill AFB, FL 3	Continuous	188
VR1102	188FW AR ANG, 4850 Leigh Ave., Fort Smith, AR 72903-6096 DSN 778-5502, C479-573-	Same as Originating Activity.	Continuous	139
VR1103	188FW-AR ANG, 4850 Leigh Ave., Fort Smith, AR 72903-6096 DSN 778-5502, C479-573-	Same as Originating Activity.	Continuous	145
VR1104	188FW-AR ANG, 4850 Leigh Ave., Fort Smith, AR 72903 DSN 778-5502, C479-573-5502.	Same as Originating Activity.	Continuous	133
VR1105	149 FTR GP (TX-ANG), Kelly AFB, TX 78241 DSN 945-5934, C210-925-5934.	Same as Originating Activity	0800-1830 local daily	106
VR1106	149 FTR GP (TX-ANG), Kelly AFB, TX 78241 DSN 969-5934.	Same as Originating Activity	0800-1830 local daily	106
VR1107	150 SOW OG/CC, 2251 Air Guard Rd. SE, Kirtland AFB, NM 87117-5875 C505-846-8335/	Same as Originating Activity	Sunrise-2200 local daily	296
VR1108	47 OSS/OSOR, 570 2nd St., Suite 6, Laughlin AFB, TX 78843 DSN 732-5864, C830-298	87 FTS/DOS, 570 2nd St., Laughlin AFB, TX 78843 DSN 732-5484, C830-298-5484. Sch	Sunrise-Sunset only	144
VR1109	47 OSS/OSOR, 570 2nd St., Suite. 6, Laughlin AFB, TX 78843 DSN 732-5864, C830-29	87 FTS/DOS, 570 2nd St., Laughlin AFB, TX 78843 DSN 732-5484, C830-298-5484. Sch	Sunrise-Sunset daily	131
VR1110	301 OG/SUA, NAS JRB, Fort Worth, TX 76127 DSN 739-6903/04/05, C817-782-6903/04/0	Same as Originating Activity	0700-2200 local daily, OT by NOTAM	94
VR1113	188FW- AR ANG, 4850 Leigh Ave., Fort Smith, AR 72903-6096 DSN 778-5502 C479-573-	Same as Originating Activity.	Continuous	229
VR1116	OC-ALC/10 FLTS, 4805 West Dr, Tinker AFB, OK 73145-3300 DSN 336-7719/7710, C405-	Same as Originating Activity	Daylight hours only	193
VR1117	47 OSS/OSOR, 570 2nd St., Suite. 6, Laughlin AFB, TX 78843 DSN 732-5864, C830-29	87 FTS/DOS, 570 2nd St., Laughlin AFB, TX 78843 DSN 732-5484, C830-298-5484. Sch	Sunrise-Sunset Sat-Sun	131
VR1120	149 FW (TX ANG), 107 Hensley Street, Kelly AFB, TX 78241-5544 DSN 945-5934, C210	Same as Originating Activity	Sunrise-Sunset	146
VR1121	149 FW (TX ANG), 107 Hensley Street, Kelly AFB, TX 78241-5544 DSN 945-5934, C210	Same as Originating Activity	Sunrise-Sunset	146
VR1122	149 FW (TX ANG), 107 Hensley Street, Kelly AFB, TX 78241-5544 DSN 945-5934, C210	Same as Originating Activity	Sunrise-Sunset	221
VR1123	149 FW (TX ANG), 107 Hensley Street, Kelly AFB, TX 78241-5544 DSN 945-5934, C210	Same as Originating Activity	Sunrise-Sunset	221
VR1124	301 OG/SUA, NAS JRB, Fort Worth, TX 76127 DSN 739-6903/04/05, C817-782-6903/04/0	Same as Originating Activity	0700-2200 local daily, OT by NOTAM	68
VR1128	301 OG/SUA, NAS JRB, Fort Worth, TX 76127 DSN 739-6903/04/05, C817-782-6903/04/0	Same as Originating Activity	0700-2200 local daily, OT by NOTAM	251
VR1130	188FW- AR ANG, 4850 Leigh Ave., Fort Smith, AR 72903-6096 DSN 778-5502, C479-573	Same as Originating Activity.	Continuous	134
VR1137	301 OG/SUA, NAS JRB, Fort Worth, TX 76127 DSN 739-6903/04/05, C817-782-6903/04/0	Same as Originating Activity	0700-2200 local daily, OT by NOTAM	235
VR1139	80th OSS/OSOA, 1911 J. Ave. STE 3, Sheppard AFB, TX 76311 DSN 736-0576, C940-676	90/469 FTS, Sheppard AFB, TX 76311 DSN 736-8090/4995, C940-676-8090.	Sunrise-Sunset	255
VR114	27 SOAOS/DOOA, 301 S. Chindit Ave., Building 790, Rm 120 Cannon AFB, NM 88103 DS	27 SOAOS/DOOS, 301 S. Chindit Ave., Building 790, Rm 111 Cannon AFB, NM 88103 DS	Continuous	210
VR1140	80th OSS/OSOA, 1911 J. Ave. STE 3, Sheppard AFB, TX 76311 DSN 736-0576, C940-676	90/469 FTS, Sheppard AFB, TX 76311 DSN 736-8090/4995, C940-676-8090.	Sunrise-Sunset	255

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
VR1141	80th OSS/OSOA, 1911 J. Ave. STE 3, Sheppard AFB, TX 76311 DSN 736-0576, C940-676	90/469 FTS, Sheppard AFB, TX 76311 DSN 736-8090/4995, C940-676-8090.	Sunrise-Sunset	264
VR1142	80th OSS/OSOA, 1911 J. Ave. STE 3, Sheppard AFB, TX 76311 DSN 736-0576, C940-676	90/469 FTS, Sheppard AFB, TX 76311 DSN 736-8090/4995, C940-676-8090.	Sunrise-Sunset	264
VR1143	80th OSS/OSOA, 1911 J. Ave. STE 3, Sheppard AFB, TX 76311 DSN 736-0576, C940-676	90/469 FTS, Sheppard AFB, TX 76311 DSN 736-8090/4995, C940-676-8090.	Sunrise-Sunset	297
VR1144	80th OSS/OSOA, 1911 J. Ave. STE 3, Sheppard AFB, TX 76311 DSN 736-0576, C940-676	90/469 FTS, Sheppard AFB, TX 76311 DSN 736-8090/4995, C940-676-8090.	Sunrise-Sunset	297
VR1145	80th OSS/OSOA, 1911 J. Ave. STE 3, Sheppard AFB, TX 76311 DSN 736-0576, C940-676	90/469 FTS, Sheppard AFB, TX 76311 DSN 736-8090/4995, C940-676-8090.	Sunrise-Sunset	278
VR1146	80th OSS/OSOA, 1911 J. Ave. STE 3, Sheppard AFB, TX 76311 DSN 736-0576, C940-676	90/469 FTS, Sheppard AFB, TX 76311 DSN 736-8090/4995, C940-676-8090.	Sunrise-Sunset	278
VR1175	OC-ALC/10 Flight Test Sqdn, 4805 West Dr, Tinker AFB, OK 73145-3300 DSN 336-7719	Same as Originating Activity	Sunrise-Sunset	392
VR1176	OC-ALC/10 Flight Test Sqdn, 4805 West Dr, Tinker AFB, OK 73145-3300 DSN 336-7719	Same as Originating Activity	Sunrise-Sunset	392
VR118	301 OG/SUA, NAS JRB, Fort Worth, TX 76127 DSN 739-6903/04/05, C817-782-6903/04/0	Same as Originating Activity	0700-2200 local, OT by NOTAM	97
VR1182	188FW-AR ANG, 4850 Leigh Ave., Fort Smith, AR 72903-6096 DSN 778-5502, C479-573-	Same as Originating Activity.	Continuous	231
VR119	71 OSS, 301 Gritz Street, Vance AFB, OK 73705-5202 DSN 448-6276/7820, C580-213-6	Same as Originating Activity.	Sunrise-Sunset daily	208
VR1195	150 SOW OG/CC, 2251 Air Guard Rd. SE, Kirtland AFB, NM 87117-5875 C505-846-8335/	Same as Originating Activity	Sunrise-2200 local daily	296
VR1196	ANG CRTC-Gulfport/OSA, 4715 Hewes Ave, Gulfport, MS 39507-4324 DSN 363-6027, C22	Same as Originating Activity	Continuous	234
VR1205	COMMANDER 412 TW, 412 OSS/OSOF, 100 East Sparks Road, Edwards AFB, CA 93523-6460	COMMANDER 412 TW, 412 OSS/OSOS, 235 S. Flight Line Road, Edwards AFB, CA 93523-6	Continuous	239
VR1206	COMMANDER 412 TW, 412 OSS/OSOF, 100 East Sparks Road, Edwards AFB, CA 93523-6460	COMMANDER 412 TW, 412 OSS/OSOS, 235 S. Flight Line Road, Edwards AFB, CA 93523-6	Continuous	55
VR1214	COMMANDER, 412 TW, 412 OSS/OSO, 100 East Sparks Road, Edwards AFB, CA 93523-6460	COMMANDER 412 TW, 412 OSS/OSOS, 235 S. Flight Line Road, Edwards AFB, CA 93523-6	Continuous	277
VR1215	COMMANDER, 412 TW, 412 OSS/OSO, 100 East Sparks Rd, Edwards AFB, CA 93523-6460 D	COMMANDER, 412 TW 412 OSS/OSOS, 235 South Flightline Rd, Edwards AFB, CA 93523-6	Sunrise-Sunset daily	145
VR1217	COMMANDER 412 TW, 412 OSS/OSO, 100 East Sparks Road, Edwards AFB, CA 93523-6460	COMMANDER 412 TW, 412 OSS/OSOS, 235 S. Flight Line Road, Edwards AFB, CA 93523-6	Sunrise-Sunset daily	135
VR1218	COMMANDER 412 TW, 412 OSS/OSO, 100 East Sparks Road, Edwards AFB, CA 93523-6460	COMMANDER 412 TW, 412 OSS/OSOS, 235 S. Flight Line Road, Edwards AFB, CA 93523-6	Sunrise-Sunset daily	252
VR125	27 SOAOS/DOOA, 301 S. Chindit Ave., Building 790, Rm 120 Cannon AFB, NM 88103 DS	27 SOAOS/DOOS, 301 S. Chindit Ave., Building 790, Rm 111 Cannon AFB, NM 88103 DS	Continuous	384
VR1250	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, NAS Lemoore, C	Same as Originating Activity	Daylight hours, OT by NOTAM	468
VR1251	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, NAS Lemoore, C	Same as Originating Activity	Daylight hours, OT by NOTAM	688
VR1252	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, NAS Lemoore, C	Same as Originating Activity	Daylight hours, OT by NOTAM	237

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
VR1253	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, NAS Lemoore, C	Same as Originating Activity	Daylight hours, OT by NOTAM	567
VR1254	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, NAS Lemoore, C	Same as Originating Activity	Daylight hours, OT by NOTAM	326
VR1255	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, NAS Lemoore, C	Same as Originating Activity	Daylight hours, OT by NOTAM	377
VR1256	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, NAS Lemoore, CA	Same as Originating Activity	Daylight hours, OT by NOTAM	111
VR1257	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, Rm 121, NAS Le	Same as Originating Activity	Daylight hours, OT by NOTAM	530
VR1259	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, NAS Lemoore, C	Same as Originating Activity	Daylight hours, OT by NOTAM	550
VR1260	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, NAS Lemoore, C	Same as Originating Activity	Daylight hours, OT by NOTAM	378
VR1261	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, NAS Lemoore, C	Same as Originating Activity	Daylight hours, OT by NOTAM	508
VR1262	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, NAS Lemoore, C	Same as Originating Activity	Daylight hours, OT by NOTAM	418
VR1264	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, NAS Lemoore, C	Same as Originating Activity	Daylight hours, OT by NOTAM	192
VR1265	G-3, 3D MAW, MCAS Miramar, San Diego, CA 92145 DSN 267-5157, C858-577-5157. Non-	Flight Planning, MCAS Miramar, San Diego, CA 92145 DSN 267-4981/1532.	Continuous	492
VR1266	Commanding Officer, Yuma MCAS, Box 99160 Yuma, AZ 85369-9160 DSN 269-2326/2077,	Same as Originating Activity. Available 0700-2230L/1400-0530Z daily. Closed holi	Continuous	189
VR1267	Commanding Officer, Yuma MCAS, Box 99160 Yuma, AZ 85369-9160 DSN 269-2326/2077,	Same as Originating Activity. Available 0700-2230L/1400-0530Z daily. Closed holi	Continuous	259
VR1267A	Commanding Officer, Yuma MCAS, Box 99160 Yuma, AZ 85369-9160 DSN 269-2326/2077,	Same as Originating Activity. Available 0700-2230L/1400-0530Z daily. Closed holi	Continuous	121
VR1268	Commanding Officer, Yuma MCAS, Box 99160 Yuma, AZ 85369-9160 DSN 269-2326/2077,	Same as Originating Activity. Available 0700-2230L/1400-0530Z daily. Closed holi	Continuous	447
VR1293	COMMANDER 412 TW, 412 OSS/OSOF, 100 East Sparks Road, Edwards AFB, CA 93523-6460	COMMANDER 412 TW, 412 OSS/OSOS, 235 S. Flight Line Road, Edwards AFB, CA 93523-6	Continuous	24
VR1300	124 WG, Gowen Field, Boise, ID 83705 DSN 422-5348, C208-422-5348.	366 OSS/OSOS, Mountain Home AFB, ID 83648, DSN 728-4607/2172, C208-828-4607/2172	Continuous or by NOTAM	582
VR1301	124 WG, Gowen Field, Boise, ID 83705 DSN 422-5348, C208-422-5348.	366 OSS/OSOS, Mountain Home AFB, ID 83648, DSN 728-4607/2172, C208-828-4607/2172	Continuous	439
VR1302	124 WG, Gowen Field, Boise, ID 83705 DSN 422-5348, C208-422-5348.	366 OSS/OSOS, Mountain Home AFB, ID 83648, DSN 728-4607/2172, C208-828-4607/2172	Continuous	261
VR1303	124 WG, Gowen Field, Boise, ID 83705 DSN 422-5348, C208-422-5348.	366 OSS/OSOS, Mountain Home AFB, ID 83648, DSN 728-4607/2172, C208-828-4607/2172	Continuous or by NOTAM	582
VR1304	124 WG, Gowen Field, Boise, ID 83705 DSN 422-5348, C208-422-5348.	366 OSS/OSOS, Mountain Home AFB, ID 83648, DSN 728-4607/2172, C208-828-4607/2172	Continuous or by NOTAM	612
VR1305	124 WG, Gowen Field, Boise, ID 83705 DSN 422-5348, C208-422-5348.	366 OSS/OSOS, Mountain Home AFB, ID 83648, DSN 728-4607/2172, C208-828-4607/2172	Continuous or by NOTAM	612
VR1350	Commanding Officer (N38), NAS Whidbey Island, 3730 N. Charles Porter Ave, Oak Ha	Same as Originating Activity	Continuous	385
VR1351	Commanding Officer (N38), NAS Whidbey Island, 3730 N. Charles Porter Ave, Oak Ha	Same as Originating Activity	Continuous	548

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
VR1352	Commanding Officer (N38), NAS Whidbey Island, 3730 N. Charles Porter Ave, Oak Ha	Same as Originating Activity	Continuous	426
VR1353	Commanding Officer, NAS Whidbey Island, 3730 N. Charles Porter Ave, Oak Harbor,	ATCFO (N33), NAS Whidbey Island, 3730 N. Charles Porter Ave, Oak Harbor, WA 9827	Continuous	433
VR1354	Commanding Officer (N38), NAS Whidbey Island, 3730 N. Charles Porter Ave, Oak Ha	Same as Originating Activity	Continuous	187
VR1355	Commanding Officer (N38), NAS Whidbey Island, 3730 N. Charles Porter Ave, Oak Ha	Same as Originating Activity	Continuous	326
VR138	DET 1, 184 IW, Smokey Hill Ang Range, 84 W Farrelly Rd, Salina, KS 67401-9407. P	Same as Originating Activity	Continuous	240
VR140	12 OSS/OSOA, 501 I Street East, Randolph AFB, TX 78150-4333 DSN 487-5580, C210-6	560 FTS, 1450 5th Street East, Randolph AFB, TX 78150, DSN 487-3518, C210-652-35	Sunrise-Sunset, daily	277
VR142	12 OSS/OSOA, 501 I Street East, Randolph AFB, TX 78150-4333 DSN 487-5580, C210-6	99 FTS, 1450 5th Street East, Randolph AFB, TX 78150-5000 DSN 487-6746, C210-652	Sunrise-Sunset, daily	208
VR1422	388 RANS/RST, 6606 Cedar Lane, Hill AFB, UT 84056-5812, DSN 777-4401, C801-777-4	Same as Originating Activity.	0700-2400 lcl Mon-Thurs, 0700-1800 lcl Fri, 0800-1700 lcl Sat	202
VR1423	388 RANS/RST, 6606 Cedar Lane, Hill AFB, UT 84056-5812, DSN 777-4401, C801-777-4	Same as Originating Activity.	0700-2400 lcl Mon-Thurs, 0700-1800 lcl Fri, 0800-1700 lcl Sat	120
VR1427	140th Wing /DOT, Buckley ANGB, Aurora, CO 80011-9546 DSN 847-9466, C303-340-9470	140th Wing /DOT, Buckley ANGB, Aurora, CO 80011-9546 DSN 847-9472, C720-847-9472	0800-1600 local Tue-Sat, OT by NOTAM	249
VR143	12 OSS/OSAS, 501 I Street East, Randolph AFB TX 78150-4333, DSN 487-5580, C210-6	560 FTS, 1450 5th Street East, Randolph AFB TX 78150-4333, DSN 487-3518, C210-65	0700-2200 local, OT by NOTAM	431
VR144	97 OSS/DOA, 400 N Sixth St., Altus AFB, OK 73521 DSN 866-6098, C580-481-6098.	97 OSS/OSK, 400 N Sixth St. Suite 12, Altus AFB, OK 73521 DSN 866-7110.	0830-0230 Local Mon-Fri	87
VR1445	388 RANS/RST, 6606 Cedar Lane, Hill AFB, UT 84056-5812, DSN 777-4401, C801-777-4	Same as Originating Activity.	0700-2400 lcl Mon-Thurs, 0700-1800 lcl Fri, 0800-1700 lcl Sat	13
VR1446	388 RANS/RST, 6606 Cedar Lane, Hill AFB, UT 84056-5812, DSN 777-4401, C801-777-4	Same as Originating Activity.	0700-2400 lcl Mon-Thurs, 0700-1800 lcl Fri, 0800-1700 lcl Sat	14
VR151	COMTRAWING TWO, NAS Kingsville, TX 78363 DSN 876-6518.	Same as Originating Activity	Daily 0600-2200 local	261
VR152	DET 1, 184 IW, Smokey Hill Ang Range, 84 W Farrelly Rd, Salina, KS 67401-9407. P	Same as Originating Activity	Continuous	239
VR1520	114 FW (ANG), Joe Foss Field, Sioux Falls, SD 57104-0264 DSN 798-7754, C605-988-	Same as Originating Activity.	Daylight hours, Mon-Sat, OT By NOTAM	376
VR1521	114 FW (ANG), Joe Foss Field, Sioux Falls, SD 57104-0264 DSN 798-7754, C605-988-	Same as Originating Activity.	Daylight hours, Mon-Sat, OT by NOTAM	376
VR1525	509 OSS/OSOA, 905 Spirit Blvd, Whiteman AFB, MO 65305 DSN 975-1779/1754, C660-68	394 CTS/Operations Supervisor, 605 5th Street, Whiteman AFB, MO 65305 DSN 975-23	Sunrise-Sunset Sun-Fri	157
VR1546	188FW AR ANG , 4850 Leigh Ave., Fort Smith, AR 72903-6096 DSN 778-5502, C479-573	Same as Originating Activity.	Continuous	154
VR156	149 FTR GP (TX-ANG), Kelly AFB, TX 78241 DSN 945-5934, C210-925-5934.	Same as Originating Activity	0800-1830 local daily, Prior coordination required for Sun-Mon operations	239
VR158	80th OSS/OSOA, 1911 J. Ave. STE 3, Sheppard AFB, TX 76311 DSN 736-0576, C940-676	90/469 FTS, Sheppard AFB, TX 76311 DSN 736-8090/4995, C940-676-8090.	Sunrise-Sunset	250
VR159	80th OSS/OSOA, 1911 J. Ave. STE 3, Sheppard AFB, TX 76311 DSN 736-0576, C940-676	90/469 FTS, Sheppard AFB, TX 76311 DSN 736-8090/4995, C940-676-8090.	Sunrise-Sunset	246

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
VR1616	ANG CRTC, Camp Douglas, WI 54618-5001 DSN 871-1445 C608-427-1445.	Same as Originating Activity	Sunrise to Sunset Mon-Sat, OT by NOTAM	236
VR1617	180th TFG/DO (ANG), Toledo Express Airport, Swanton, OH 43558 DSN 580-4084.	Same as Originating Activity	Sunrise-2100 local	248
VR1624	ALPENA CRTC/Airspace Scheduling Office, 5884 A. Sreet, Alpena, MI 49707, C989-35	Same as Originating Activity	Sunrise-Sunset	326
VR1625	ALPENA CRTC/Airspace Scheduling Office, 5884 A. Sreet, Alpena, MI 49707, C989-35	Same as Originating Activity	Sunrise-Sunset	234
VR1626	ALPENA CRTC/Airspace Scheduling Office, 5884 A. Sreet, Alpena, MI 49707 C989-354	Same as Originating Activity	Sunrise-Sunset	202
VR1627	ALPENA CRTC/Airspace Scheduling Office, 5884 A. Sreet, Alpena, MI 49707, C989-35	Same as Originating Activity	Sunrise-Sunset	322
VR1628	ALPENA CRTC/Airspace Scheduling Office, 5884 A. Sreet, Alpena, MI 49707, C989-35	Same as Originating Activity	Sunrise-Sunset	407
VR1629	ALPENA CRTC/Airspace Scheduling Office, 5884 A. Sreet, Alpena, MI 49707, C989-35	Same as Originating Activity	Sunrise-Sunset	317
VR1631	445 AW, 5439 McCormick Ave, Wright-Patterson AFB, OH 45433, DSN 787-3551, C937-2	445 OSS/OSK, Wright-Patterson AFB, OH 45433, DSN 672-2582, C937-522-2582.	Continuous	295
VR1632	445 AW, 5439 McCormick Ave, Wright-Patterson AFB, OH 45433, DSN 787-3551, C937-2	445 OSS/OSK, Wright-Patterson AFB, OH 45433, DSN 672-2582, C937-522-2582.	Continuous	258
VR1633	445 AW, 5439 McCormick Ave, Wright-Patterson AFB, OH 45433, DSN 787-3551, C937-2	445 OSS/OSK, Wright-Patterson AFB, OH 45433, DSN 672-2582, C937-522-2582.	Continuous	278
VR1636	Alpena CRTC/OTM (ANG), 5884 A. Street, Alpena, MI 49707-8125 DSN 741-3509/3226.	Same as Originating Activity	Continuous	196
VR1638	180TH FW/OSO, Toledo Express Airport, Swanton, OH 43558 C419-868-4036, DSN 580-4	Same as Originating Activity	Sunrise-2100 local	198
VR1639	ALPENA CRTC/Airspace Scheduling Office, 5884 A. Sreet, Alpena, MI 49707, C989-35	Same as Originating Activity	Sunrise-Sunset	317
VR1640	Atterbury Range, JFAC-IN-DETI, Building 124, Edinburgh, IN 46124, C812-526-1114,	Same as Originating Activity	1300-0300Z++ daily	297
VR1641	Atterbury Range, JFAC-IN-DETI, Building 124, Edinburgh, IN 46124, C812-526-1114,	Same as Originating Activity	1300-0300Z++ daily	175
VR1642	Atterbury Range, JFAC-IN-DETI, Building 124, Edinburgh, IN 46124, C812-526-1114,	Same as Originating Activity	1300-0100Z++ daily	231
VR1644	ALPENA CRTC/Airspace Scheduling Office, 5884 A. Sreet, Alpena, MI 49707, C989-35	Same as Originating Activity	Sunrise-Sunset	354
VR1645	ALPENA CRTC/Airspace Scheduling Office, 5884 A. Sreet, Alpena, MI 49707, C989-34	Same as Originating Activity	Sunrise-Sunset	234
VR1647	ALPENA CRTC/Airspace Scheduling Office, 5884 A. Sreet, Alpena, MI 49707, C989-34	Same as Originating Activity	Sunrise-Sunset	322
VR1648	ALPENA CRTC/Airspace Scheduling Office, 5884 A. Sreet, Alpena, MI 49707, C989-34	Same as Originating Activity	Sunrise-Sunset	407
VR1650	ANG CRTC, Camp Douglas, WI 54618-5001 DSN 871-1445 C608-427-1445.	Same as Originating Activity	0730 local-Sunset Tue-Sat, OT by NOTAM	118
VR1666	Alpena CRTC/Airspace Scheduling Office, 5884 A. Street, Alpena, MI 49707, C989-3	Same as Originating Activity	Continuous	196
VR1667	180 TFG/DO, Toledo Express Airport, Swanton, OH 43558 DSN 580-4084.	Same as Originating Activity	Sunrise - 0200Z++	248
VR1668	180TH FW/OSO, Toledo Express Airport, Swanton, OH 43558 C419-868-4036, DSN 580-4	Same as Originating Activity	Sunrise-2100 local	198
VR1679	JFAC-IN/DET 1, Atterbury ANG Range, Bldg 124, Camp Atterbury, IN 46124 DSN 569-2	Same as Originating Activity	Sunrise-Sunset Tue-Sun, OT by NOTAM	338
VR168	COMTRAWING TWO, NAS Kingsville, TX 78363 DSN 876-6518/6283, C361-516-6518/6283/6	Same as Originating Activity	0600-2400 local daily	284
VR1709	177/FW/DET1, Warren Grove Range, NJ DSN 455-6700, C609-761-6700. E-mail usaf.nj.	EASTERN AIR DEFENSE SECTOR, Rome, NY, DSN 587-6247, C315-334-6247.	Sunrise-2200L	380
VR1711	113 WG, Andrews AFB, MD 20331 DSN 857-3307/08, C240-857-3307/3308/4190.	Same as Originating Activity	0730 local-Sunset daily	201
VR1712	113 WG, Andrews AFB, MD 20331 DSN 857-3307/08, C240-857-3307/3308/4190.	Same as Originating Activity	0730 local-Sunset daily	236

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
VR1713	113 WG, JB Andrews, MD 20331 DSN 857-3307/08, C240-857-3307/3308/4190.	Same as Originating Activity	0730 local-Sunset daily	244
VR1721	437 OSS/OSO, Joint Base Charleston, SC 29404, DSN 673-5554, C843-963-5554.	437 OSS/OSO, Joint Base Charleston, SC 29404, DSN 673-5554, C843-963-5554.	Continuous	212
VR1722	COMSTRK FIGHTWINGLANT, NAS Oceana, Virginia Beach, VA 23460-5200 DSN 433-9141, C	FACSFAC/VACAPES, NAS Oceana, Virginia Beach, VA 23460 DSN 433-1228, C757-433-122	Sunrise-Sunset	380
VR1726	4 OSS/OSOR, Seymour Johnson AFB, NC 27531-5004 DSN 722-2672, C919-722-2672.	4 OSS/OSOS, Seymour Johnson AFB, NC 27531-5004 DSN 722-2129/2124, C919-722-2129/	Continuous	179
VR1743	COMSTRKFIGHTWINGLANT, Oceana NAS, Virginia Beach, VA 23460 DSN 433-9141, C 757-4	FACSFAC VACAPES, Oceana NAS, Virginia Beach, VA 23460 DSN 433-1228, C757-433-122	Continuous	178
VR1753	COMSTRKFIGHTWINGLANT, Oceana NAS, Virginia Beach, VA 23460 DSN 433-9521, C757-43	FACSFAC VACAPES, Oceana NAS, Virginia Beach, VA 23460 DSN 433-1228 C757-433-1228	Continuous	215
VR1754	COMSTRKFIGHTWINGLANT, NAS Oceana, Virginia Beach, VA 23460-5200 DSN 433-9141, C7	FACSFAC/VACAPES, NAS Oceana, Virginia Beach, VA 23460 DSN 433-1228 C757-433-1228	Continuous	472
VR1755	COMSTRK FIGHTWINGLANT, NAS Oceana, Virginia Beach, VA 23460-5200 DSN 433-9141, C	FACSFAC/VACAPES, NAS Oceana, Virginia Beach, VA 23460 DSN 433-1228 C757-433-1228	Continuous	283
VR1756	COMSTRKFIGHTWINGLANT, NAS Oceana, Virginia Beach, VA 23460-5200 DSN 433-9141, C7	FACSFAC/VACAPES, NAS Oceana, Virginia Beach, VA 23460 DSN 433-1228 C757-433-1228	Continuous	463
VR1757	COMSTRKFIGHTWINGLANT, NAS Oceana, Virginia Beach, VA 23460-5200 DSN 433-9141, C7	FACSFAC/VACAPES, NAS Oceana, Virginia Beach, VA 23460 DSN 433-1228 C757-433-1228	Continuous	219
VR1759	COMSTRKFIGHTWINGLANT, NAS Oceana, Virginia Beach, VA 23460-5200 DSN 433-9141, C7	FACSFAC/VACAPES, NAS Oceana, Virginia Beach, VA 23460 DSN 433-1228, C757-433-122	Continuous	242
VR176	49 OSS/OSOA, 744 Delaware Ave., Holloman AFB, NM 88330-8014, DSN 572-2638, C575-	49 OSS/OSOS, 744 Delaware Ave., Holloman AFB, NM 88330-8014, DSN 572-3536, C575-	Normally 1500-2400Z++ daily, usage between 2400-1500Z++ is available	565
VR179	ANG CRTC-Gulfport/OSA, 4715 Hewes Ave, Gulfport, MS 39507-4324 DSN 363-6027, C22	Same as Originating Activity	Continuous	199
VR1800	DET 1, 174 ATKW, PO Box 320, Antwerp, NY 13608 DSN 772-5990/2835, C315-772-5990/	EADS/DOAS 224 Air Def Squadron, EASTERN AIR DEFENSE SECTOR DSN 587-6247, C315-33	0800 local-Sunset daily	195
VR1801	DET 1, 174ATKW, P.O. BOX 320, ANTWERP, NY 13608 DSN 772-2835/5990, C315-772-2835	EADS/DOAS 224 Air Def Squadron, EASTERN AIR DEFENSE SECTOR DSN 587-6247, C315-33	0800 local-Sunset daily	207
VR184	97 OSS/DOA, 101 S Sixth St., Bdg 225, Altus AFB, OK 73521 DSN 866-6098, C580-481	97 OSS/OSK, 101 S Sixth St., Bdg 225, Altus AFB, OK 73521 DSN 866-7422/1375/7490	0830-0230 local, Mon-Fri	86
VR186	301 OG/SUA, NAS JRB, Fort Worth, TX 76127 DSN 739-6903/04/05, C817-782-6903/04/0	Same as Originating Activity	0700-2200 local, OT by NOTAM	346
VR189	188 Wing-AR ANG, 4850 Leigh Ave., Fort Smith, AR 72903-6096 DSN 778-5502, C479-5	Same as Originating Activity.	Continuous	265
VR190	97 OSS/DOA, 400 N. Sixth Street, Altus AFB, OK 73521 DSN 866-6098 C580-6098.	97 OSS/OSK, 400 N. Sixth Street, Suite 12, Altus AFB, OK 73521 DSN 866-7110.	0830-0230 local Mon-Fri	185
VR1900	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	536
VR1902	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	3 OSS/OSOS Elmendorf AFB, AK 99706 DSN 317-552-2406, C907-552-2406.	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	510

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
VR1905	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	3 OSS/OSOS Elmendorf AFB, AK 99706 DSN 317-552-2406, C907-552-2406.	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	636
VR1909	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	174
VR191	97 OSS/DOA, 400 N. Sixth Street, Altus AFB, OK 73521 DSN 866-6098 C580-6098.	97 OSS/OSK, 400 N. Sixth Street, Suite 12, Altus AFB, OK 73521 DSN 866-7110.	0830-0230 local Mon-Fri	185
VR1912	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	3 OSS/OSOS Elmendorf AFB, AK 99706 DSN 317-552-2406, C907-552-2406.	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	618
VR1915	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	3 OSS/OSOS Elmendorf AFB, AK 99706 DSN 317-552-2406, C907-552-2406.	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	636
VR1916	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	454
VR1939	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	174
VR196	47 OSS/OSOR, 570 2nd Street, Ste. 6, Laughlin AFB, TX 78843 DSN 732-5864, C830-2	86 FTS/DOS, 307 2nd St, Laughlin AFB, TX 78843 DSN 732-5584, C830-298-5584. Sche	Sunrise-Sunset daily	220
VR197	47 OSS/OSOR, 570 2nd Street, Ste. 6, Laughlin AFB, TX 78843 DSN 732-5864, C830-2	86 FTS/DOS, 307 2nd St, Laughlin AFB, TX 78843 DSN 732-5584, C830-298-5584. Sche	Sunrise-Sunset daily	220
VR198	97 OSS/DOA, 400 N. 6th St., Ste. A, Altus AFB, OK 73521 DSN 866-6098, C580-481-6	Same as Originating Activity	0600-0300 local, Mon-Fri, OT by NOTAM	239
VR199	97 OSS/DOA, 400 N. 6th St., Ste. A, Altus AFB, OK 73521 DSN 866-6098, C580-481-6	Same as Originating Activity	0600-0300 local, Mon-Fri, OT by NOTAM	239
VR201	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, NAS Lemoore, C	Same as Originating Activity	Daylight hours, OT by NOTAM	216
VR202	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, NAS Lemoore, C	Same as Originating Activity	Daylight hours, OT by NOTAM	405
VR208	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, NAS Lemoore, C	Same as Originating Activity	0800-1630 local	247
VR209	Commander, Strike Fighter Wing, U.S. Pacific Fleet, 001 K Street, NAS Lemoore, C	Same as Originating Activity	Daylight hours, OT by NOTAM	754
VR222	57 OSS/OSOS, Nellis AFB, NV 89191-7001 DSN 682-2040, C702-652-2040.	Same as Originating Activity	Continuous	411
VR223	56 RMO/ASM, 7101 Jerstad, Luke AFB, AZ 85309-1647 DSN 896-5855, C623-856-5855/58	56 RMO/ASM, 7101 Jerstad, Luke AFB, AZ 85309-1647 DSN 896-7654, C623-856-7654, c	0600-2400 Mon-Fri local, Other times by NOTAM	150
VR231	56 RMO/ASM, 7101 Jerstad, Luke AFB, AZ 85309-1647 DSN 896-5855, C623-856-5855/58	56 RMO/ASM, 7101 Jerstad, Luke AFB, AZ 85309-1647 DSN 896-7654, C623-856-7654, c	0600-2400 Mon-Fri local, Other times by NOTAM	130
VR239	56 RMO/ASM, 7101 Jerstad, Luke AFB, AZ 85309-1647 DSN 896-5855, C623-856-5855/58	56 RMO/ASMS, 7101 Jerstad, Luke AFB, AZ 85309-1647 DSN 896-7654, See General Rem	0600-2400 Mon-Fri local, Other times by NOTAM	358
VR241	56 RMO/ASM, 7101 Jerstad, Luke AFB, AZ 85309-1647 DSN 896-5855, C623-856-5855/58	56 RMO/ASMS, 7101 Jerstad, Luke AFB, AZ 85309-1647 DSN 896-7654, See General Rem	0600-2400 Mon-Fri local, Other times by NOTAM	260
VR242	56 RMO/ASM, 7101 Jerstad, Luke AFB, AZ 85309-1647 DSN 896-5855, C623-856-5855/58	56 RMO/ASMS, 7101 Jerstad, Luke AFB, AZ 85309-1647 DSN 896-7654, C623-586-7654	0600-2400 Mon-Fri local, Other times by NOTAM	318
VR243	56 RMO/ASM, 7101 Jerstad, Luke AFB, AZ 85309-1647 DSN 896-5855, C623-856-5855/58	56 RMO/ASMS, 7101 Jerstad, Luke AFB, AZ 85309-1647 DSN 896-7654, See General Rem	0600-2400 Mon-Fri local, Other times by NOTAM	325

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
VR244	56 RMO/ASM, 7101 Jerstad, Luke AFB, AZ 85309-1647 DSN 896-5855, C623-856-5855/58	56 RMO/ASMS, 7101 Jerstad, Luke AFB, AZ 85309-1647 DSN 896-7654, See General Rem	0600-2400 Mon-Fri local, Other times by NOTAM	324
VR245	56 RMO/ASM, 7101 Jerstad, Luke AFB, AZ 85309-1647 DSN 896-5855, C623-856-5855/58	56 RMO/ASMS, 7101 Jerstad, Luke AFB, AZ 85309-1647 DSN 896-7654, C623-856-7654,	0600-2400 Mon-Fri local, Other times by NOTAM	250
VR249	G-3, 3D MAW, MCAS Miramar, San Diego, CA 92145 DSN 267-5157, C858-577-5157. Non-	Flight Planning, MCAS Miramar, San Diego, CA 92145 DSN 267-4981/1532.	Continuous	124
VR259	162 OSS/OSOA, 1660 E. El Tigre Way, Tucson, AZ 85706 DSN 844-7078, C520-295-7078	162 OSS/OSOS, 1660 E. El Tigre Way, Tucson, AZ 85706 DSN 844-6366/6731, C520-295	Continuous	364
VR260	162 OSS/OSOA, 1660 E. El Tigre Way, Tucson, AZ 85706 DSN 844-7078, C520-295-7078	162 OSS/OSOS, 1660 E. El Tigre Way, Tucson, AZ 85706 DSN 844-6366/6731, C520-295	Continuous	325
VR263	162 OSS/OSOA, 1660 E. El Tigre Way, Tucson, AZ 85706 DSN 844-7078, C520-295-7078	162 OSS/OSOS, 1660 E. El Tigre Way, Tucson, AZ 85706 DSN 844-6366/6731, C520-295	Continuous	510
VR267	COMTRAWING TWO, NAS Kingsville, TX 78363, DSN 876-6518/6306, C361-516-6518/6306/	Same as Originating Activity.	1100-0530Z	239
VR268	COMTRAWING TWO, NAS Kingville, TX, 78363, DSN876-6518/6306, C361-516-6518/6306/6	Same as Originating Activity.	1300-0530Z++	187
VR269	COMTRAWING TWO, NAS Kingsville, TX 78363, DSN 876-6518/6306, C361-516-6518/6306/	Same as Originating Activity.	1300-0530Z++	218
VR289	COMTRAWING TWO, NAS Kingsville, TX 78363, DSN 876-6518	Same as Originating Agency	Continuous	189
VR296	COMTRAWING TWO, NAS Kingsville, TX 78363, DSN 876-6518	Same as Originating Activity	Continuous	271
VR299	COMTRAWING TWO, NAS Kingsville, TX 78363, DSN 876-6518	Same as Originating Activity	Continuous	249
VR316	124 WG, Gowen Field, Boise, ID 83705 DSN 422-5348, C208-422-5348.	366 OSS/OSOS, Mountain Home AFB, ID 83648, DSN 728-4607/2172, C208-828-4607/2172	Continuous or by NOTAM	413
VR319	124 WG, Gowen Field, Boise, ID 83705 DSN 422-5348, C208-422-5348.	366 OSS/OSOS, Mountain Home AFB, ID 83648, DSN 728-4607/2172, C208-828-4607/2172	Continuous or by NOTAM	413
VR331	62 OSS/OSK, McChord Fld, 1172 Levitow Blvd., WA 98438 DSN 382-3615, C253-982-361	62 OSS/OSO, McChord AFB, 100 Main St., WA 98438 DSN 382-9925, C253-982-2635. Dut	Continuous	261
VR389	366 OSS/OSOA, 1050 Desert Street, Building 2215, Mountain Home AFB, ID 83648, DS	366 OSS/OSOS, Mountain Home AFB, ID 83648, C208-828-2172/4607, DSN 728-2172/4607	Continuous	362
VR391	366 OSS/OSOA, 1050 Desert Street, Building 2215, Mountain Home AFB, ID 83648, DS	366 OSS/OSOS, Mountain Home AFB, ID 83648, C208-828-2172/4607, DSN 728-2172/4607	Continuous	362
VR410	140th Wing /Airspace Office, Buckley AFB, Aurora Co, 80011-9546 DSN 847-9470/947	Same as Originating Activity.	0800-1600 local Tue-Sat, OT by NOTAM	19
VR411	140th Wing /Airspace Office, Buckley AFB, Aurora Co, 80011-9546 DSN 847-9470/947	Same as Originating Activity.	0800-1600 local Tue-Sat, OT by NOTAM	19
VR413	140th Wing /Airspace Office, Buckley AFB, Aurora Co, 80011-9546 DSN 847-9470/947	140th Wing /Airspace Office, Buckley AFB, Aurora Co, 80011-9546 DSN 847-9470/947	0800-1600 local Tue-Sat, OT by NOTAM	234
VR510	114 FW (ANG), Joe Foss Field, Sioux Falls, SD 57104-0264 DSN 798-7754/7746, C605	Same as Originating Activity	Daylight Hours Tue-Sat, OT by NOTAM	432
VR511	132 FW OG/CC (ANG), 3100 McKinley Ave, Des Moines, IA 50321-2799 DSN 256-8250 C5	Same as Originating Activity	By NOTAM, (2 hr prior notification required)	340
VR512	132 FW OG/CC (ANG), 3100 McKinley Ave, Des Moines, IA 50321-2799 DSN 256-8250 C5	Same as Originating Activity	By NOTAM, 2hr prior notification required	340
VR531	DET 1, 184 IW, Smokey Hill Ang Range, 84 W Farrelly Rd, Salina, KS 67401-9407. P	Same as Originating Activity	Continuous	233

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
VR532	DET 1, 184 IW, Smokey Hill Ang Range, 84 W Farrelly Rd, Salina, KS 67401-9407. P	Same as Originating Activity	Continuous	418
VR533	DET 1, 184 IW, Smokey Hill Ang Range, 84 W Farrelly Rd, Salina, KS 67401-9407. P	Same as Originating Activity	Continuous	210
VR534	DET 1, 184 IW, Smokey Hill Ang Range, 84 W Farrelly Rd, Salina, KS 67401-9407. P	Same as Originating Activity	Continuous	214
VR535	DET 1, 184 IW, Smokey Hill Ang Range, 84 W Farrelly Rd, Salina, KS 67401-9407. P	Same as Originating Activity	Continuous	227
VR536	DET 1, 184 IW, Smokey Hill Ang Range, 84 W Farrelly Rd, Salina, KS 67401-9407. P	Same as Originating Activity	Continuous	199
VR540	114 FW OG/CC (ANG), 1201 W. Algonquin St., Sioux Falls, SD, 57104 DSN 798-7746.	114 FW OSS/OSA (ANG), Sioux Falls, SD, 57104 DSN 798-7754.	By NOTAM, 2 hr prior notification required	424
VR541	114 FW OG/CC (ANG), 1201 W. Algonquin St., Sioux Falls, SD, 57104 DSN 798-7746.	114 FW OSS/OSA (ANG), Sioux Falls, SD, 57104 DSN 798-7754.	By NOTAM, 2 hr prior notification required	385
VR544	114 FW (ANG), Joe Foss Field, Sioux Falls, SD 57104-0264 DSN 798-7754/7746, C605	Same as Originating Activity	By NOTAM, 2 hours and 15 minutes prior to entry time required	156
VR545	114 FW (ANG), Joe Foss Field, Sioux Falls, SD 57104-0264 DSN 798-7754/7746, C605	Same as Originating Activity	By NOTAM, 2 hours and 15 minutes prior to entry time required	156
VR552	DET 1, 184 IW, Smokey Hill Ang Range, 84 W Farrelly Rd, Salina, KS 67401-9407. P	Same as Originating Activity	Continuous	239
VR604	148TH FIG (ANG), Duluth Intl, MN 55811 DSN 825-7265.	Same as Originating Activity	1400-0500Z++ daily, 0500-1400Z++ allowable	984
VR607	148TH FIG (ANG), Duluth Intl, MN 55811 DSN 825-7265.	Same as Originating Activity	1400-0500Z++ daily, 0500-1400Z++ allowable	984
VR619	Jefferson Range JFAC-IN-DET2, 1661 W. Niblo Rd., Madison, IN 47250 C812-689-7295	Same as Originating Activity	Sunrise-Sunset Tue-Sun, OT by NOTAM	174
VR634	Alpena CRTC/Airspace Scheduling Office, 5884 A. Street, Alpena, MI 49707, C989-3	Same as Originating Activity	Continuous	255
VR664	Alpena CRTC/Airspace Scheduling Office, 5884 A. Street, Alpena, MI 49707, C989-3	Same as Originating Activity	Continuous	255
VR704	Bollen Range, 193 SOW, DET 1, 26139 Ammo Road, Annville, PA 17003-5180 C717-861-	Same as Originating Activity	0800 to 2200 local daily	376
VR705	Bollen Range, 193 SOW, DET. 1, 26139 Ammo Road, Annville, PA 17003-5180 C717-861	Same as Originating Activity	0800 to 2200 local daily	282
VR707	Bollen Range, 193 SOW, DET. 1, 26139 Ammo Road, Annville, PA 17003-5180 C717-861	Same as Originating Activity	0800 to 2200 local daily	382
VR708	175 FG (ANG), Baltimore, MD 21220-2899 DSN 243-6375.	Same as Originating Activity	Sunrise-Sunset	164
VR724	174th FW, 6001 E. Molloy Rd, Syracuse, NY 13211-7099 DSN 489-9217.	174 FW, Det 1, Ft. Drum, NY 13608 DSN 772-5990/2835, C315-772-5990.	0800-Sunset daily, OT by NOTAM	196
VR725	DET1, 174ATKW, P.O. BOX 320, ANTWERP, NY 13608 DSN 772-2835/5990, C315-772-2835/	EADS/DOAS 224 AIR DEF SQUADRON, EASTERN AIR DEFENSE SECTOR DSN 587-6747, C315-33	0800 Local-Sunset daily,	151
VR840	Eastern Air Defense (EADS) DSN 587-6247/6313.	Same as Originating Activity	0800 local-Sunset daily	247
VR841	Eastern Air Defense (EADS) DSN 587-6247/6313.	Same as Originating Activity	0800 local-Sunset daily	136
VR842	Eastern Air Defense (EADS) DSN 587-6247/6313.	Same as Originating Activity	0800 local-Sunset daily	122
VR931	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	3 OSS/OSOS Elmendorf AFB, AK 99706 DSN 317-552-2406, C907-552-2406.	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	316
VR932	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	3 OSS/OSOS Elmendorf AFB, AK 99706 DSN 317-552-2406, C907-552-2406.	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	316

Table A-3 Military Training Routes Inventory, continued

2018 MTR	Originating Agency*	Scheduling Agency*	Effective Times	Length (NM)**
VR933	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	3 OSS/OSOS, Elmendorf AFB, AK 99506 DSN 317-552-2406, C907-552-2406.	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	396
VR934	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	3 OSS/OSOS, Elmendorf AFB, AK 99506-2130 DSN 317-552-2406, C907-552-2406.	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	396
VR935	611 AOC/CODK, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	555
VR936	611 AOC/CODK, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	555
VR937	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	499
VR938	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	499
VR940	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	541
VR941	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	541
VR954	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	876
VR955	611 AOC/CC, 9480 Pease Ave Ste. 121, Elmendorf AFB, AK 99506-2100 DSN 317-552-57	354 OSS/OSCR, 354 Broadway St, Eielson AFB, AK 99702 DSN 317-377-9327, C907-377-	Normal use 0800-2000 local Mon-Fri, Not available 2200-0700 local	645

* Data fields are limited to 80 characters in the source database (National Geospatial-Intelligence Agency (Digital Aeronautical Flight Information File)); therefore, some data field entries are not complete. Please refer to DoD Flight Information Publications for complete originating and scheduling activity information.

** Length calculations were performed using the World Mercator projection.

Source: Department of Defense based on data from the National Geospatial-Intelligence Agency (Digital Aeronautical Flight Information File, effective: October 2017).

Table A-3 Military Training Routes Inventory, continued

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B

Abbreviation List

A

AAA	Anti-Aircraft Artillery
AAFB	Andersen Air Force Base
AAR	After Action Review
AAV	Amphibious Assault Vehicle
AAW	Anti-Air Warfare
AB	Air Base
AC	Active Component
ACC	Air Combat Command
ACHP	Advisory Council on Historic Preservation
ACM	Air Combat Maneuvers
ACUB	Army Compatible Use Buffer
AD	Active Duty
AEA	Airborne Electronic Attack
AETC	Air Education and Training Command
AFB	Air Force Base
AFC	Area Frequency Coordinator
AFI	Air Force Instruction
AFMC	Air Force Material Command
AFRC	Air Force Reserve Command
AFSOC	Air Force Special Operations Command
AFTC	Air Force Test Center
AGM	Air-to-Ground Guided Missile

AI

	Air Interdiction
AICUZ	Air Installation Compatible Use Zone
ALTRV	Altitude Reservation
AMCOM	Aviation and Missile Command
AMW	Amphibious Warfare
ANG	Air National Guard
ARFORGEN	Army Force Generation
ARRM	Army Range Requirements Model
ARSO	Army Special Operations Forces
ARTCC	Air Route Traffic Control Center
ASD/SOLIC-IC	Assistant Secretary of Defense for Special Operations/Low Intensity Conflicts and Interdependent Capabilities
ASUW	Anti-Surface Warfare
ASW	Anti-Submarine Warfare
ATCAA	Air Traffic Control Assigned Airspace
ATLS	Army Training Land Strategy
ATR	Air Training Relocation
AVCATT	Aviation Combined Arms Tactical Trainer
AVMC	Assault Vehicle Maneuver Corridor
AW	Air Wing
AW	Airlift Wing
AWI	All-Weather Intercept
AWSS	Aviation Weapon Scoring System

B

BA	Biological Assessment
BARSTUR	Barking Sands Tactical Underwater Range
BAX	Battle Area Complex
BCT	Brigade Combat Team
BFM	Basic Flight Maneuvers
BIP	Blow in Place
BLM	Bureau of Land Management
BMGR	Barry M. Goldwater Range
BMM	Borrowed Military Manpower
BO	Biological Opinion
BOD	Beneficial Occupancy Date
BOEM	Bureau of Ocean Energy Management
BOS	Base Operations Support
BOSS	Battlefield Operations Support System
BSA	Basic Surface Attack
BTS	Brown Tree Snake

C

C2	Command and Control
C4ISR	Command, Control, Communications, Computers, and Intelligence, Surveillance, and Reconnaissance
C7F	Commander, Seventh Fleet
CAB	Combat Aviation Brigade
CACTF	Combined Arms Collective Training Facility
CAF	Combat Air Forces
CALFEX	Combined Arms Live Fire Exercise
CARB	California Air Resources Board
CAS	Close Air Support
CAS	Combat Air Support
CATC	Combined Arms Training Center
CBP	Customs and Border Patrol
CCMD	Combatant Commands

CCTT	Close Combat Tactical Training
CFA	Controlled Fire Area
CJMT	Combined Joint Military Training
CLFX	Convoy Live Fire
CMAGR	Chocolate Mountains Aerial Gunnery Range
CMC	Commandant of the Marine Corps
CNAP	Commander, Naval Air Forces Pacific
CNATRA	Chief of Naval Training
CNFJ	Commander, Navy Region Japan
CNIC	Commander Naval Installation Command
CNMI	Commonwealth of the Northern Mariana Islands
CNRSW	Commander, Navy Region Southwest
COCOM	Combatant Command
COMPACFLT	Commander, Pacific Fleet
COMTHIRDFLT	Commander, Third Fleet
COMVAQWING PAC	Commander, Electronic Attack Wing, Pacific Fleet
CONOPS	Concept of Operations
CONUS	Continental United States
COP	Common Operating Procedure
CPF N7	Commander, Pacific Fleet, Training Division
CPG	Marine Corps' Planning Guidance
CPLO	Community Plans and Liaison Office
CQC	Close Quarters Combat
CR	Cultural Resource
CRRC	Combat Rubber Raiding Craft
CRTC	Combat Readiness and Training Center
CSAR	Combat Search and Rescue
CSE	Center Scheduling Enterprise
CTA	Central Training Area
CTC	Combat Training Center
CTF-70	Commander, Task Force 70
CVW	Carrier Wing
CY	Calendar Year

D

DAC	Department of Army Civilian
DAGIR	Digital Air-Ground Integration Range
DASR	Defense Aviation Safety Regulation
DBEARS	Draughton Bombing Electronic Attack Range
DCAST	Data Collection and Scheduling Tool
DDG	Guided Missile Destroyer
DEAD	Destruction of Enemy Air Defense
DESI	Diesel Electric Submarine Initiative
DESRON	Destroyer Squadron
DEVRON	Submarine Development Squadron
DMPI	Designated Mean Point of Impact
DoD	Department of Defense
DoDD	DoD Directive
DoDI	DoD Instruction
DOI	Department of the Interior
DON	Department of the Navy
DPRI	Defense Policy Review Initiative
DRFM	Digital Radio Frequency Memory
DRRS RAM	Defense Readiness Reporting System – Range Assessment Module
DPTMS	Directorate of Plans, Training, Mobilization, and Security
DPW	Department of Public Works
DTA	Donnelly Training Area
DU	Depleted Uranium

E

EA	Environmental Assessment
EAP	Encroachment Action Plan
EC	Electronic Combat
EC&C	Electronic Combat and Countermeasures
ECM	Electronic Countermeasures
ECP	Encroachment Control Plan
EIS	Environmental Impact Statement

ELMR	Enterprise Land-Mobile Radio
ECTRC	El Centro Training Range Complex
EFTR	Edwards Flight Test Range
EIS	Environmental Impact Statement
EMATT	Expendable Mobile Training Target and Field Programmability System
EOD	Explosive Ordnance Disposal
EODMU	Explosive Ordnance Disposal Mobile Unit
EOTS	Electro Optical Targeting System
EPR	Enhanced Performance Round
ES	Electronic Surveillance
ESA	Endangered Species Act
EW	Electronic Warfare
EXW	Expeditionary Warfare

F

FAA	Federal Aviation Administration
FAC	Fast Attack Craft
FACSFAC	Fleet Area Control and Surveillance Facility
FASIT	Future Army System of Integrated Targets
FDM	Farallon de Medinilla
FDNF	Forward Deployed Naval Forces
FDRLO	Fort Drum Regional Liaison Organization
FEIS	Final Environmental Impact Statement
FHL	Fort Hunter Liggett
FIAC	Fast Inshore Attack Craft
FIREX	Firing Exercise
FIS	Facility Investment Strategy
FLPMA	Federal Land Policy Management Act
FLW	Fort Leonard Wood
FMP	Full Mission Profile
FOC	Full Operational Capability
FONSI	Finding of No Significant Impact
FORSCOM	U.S. Army Forces Command

FRAGO	Fragmentary Order
FRS	Fleet Replacement Squadron
FRTC	Fallon Range Training Complex
FRTTP	Fleet Readiness Training Plan
FTU	Formal Training Unit
FTX	Field Training Exercise
FW	Fighter Wing
FWA	Fort Wainwright
FY	Fiscal Year
FYDP	Future Years Defense Program

G

GAF	German Air Force
GBSAA	Ground Based Sense and Avoid Airborne
GCE	Ground Combat Element
GHMTA	Good Hope Maneuver Training Area
GOJ	Government of Japan
GPS	Global Positioning System
GSG	Greater Sage Grouse

H

HAHO	High Altitude – High Opening
HALO	High Altitude – Low Opening
HARM	High-Speed Anti-Radiation Missile
HDR-H	Homeland Defense Radar – Hawaii
HEI	High Explosive Incendiary
HIMARS	High Mobility Artillery Rocket System
HITS	Homestation Instrumentation Training Systems
HLZ	Helicopter Landing Zone
HSC	Helicopter Sea Combat Squadron
HSM	Helicopter Maritime Strike Squadron
HSTT	Hawaii-Southern California Training and Testing
HVU	High Value Units

I

I&M	Improvement and Modernization
IADS	Integrated Air Defense System
IAM	Inertially Aided Munitions
IARC	Indiana Air Range Complex
IAW	In Accordance With
IBCT	Infantry Brigade Combat Team
IED	Improvised Explosive Device
IFF	Identification Friend or Foe
IMCOM	Installation Management Command
INRMP	Integrated Natural Resources Management Plan
IOC	Initial Operating Capability
IPBC	Infantry Platoon Battle Course
IR	Infrared
ISBC	Infantry Squad Battle Course
ISR	Intelligence, Surveillance, and Reconnaissance
ISR-MC	Installation Status Report – Mission Capacity
ISTF	Ie Shima Training Facility
ITAM	Integrated Training Area Management
ITE	Integrated Training Environment
ITESS	Instrumented Tactical Engagement Simulation System

J

JAAT	Joint Air Attack Team
JDAM	Joint Direct Attack Munition
JDEWR	Joint Deployable Electronic Warfare Range
JEB	Joint Expeditionary Base
JGSDF	Japan Ground Self-Defense Force
JIIM	Joint, interagency, inter-governmental, and multinational
JLGO	Joint Ground Liaison Office
JLOTS	Joint Logistics Over-the-Shore
JLUS	Joint Land Use Study

JNTC	Joint National Training Capability
JPARC	Joint Pacific Alaska Range Complex
JPMRC	Joint Pacific Multinational Readiness Capability
JRM	Joint Region Marianas
JRTC	Joint Readiness Training Center
JSOW	Joint Standoff Weapon
JTAC	Joint Terminal Attack Controller
JTE	Joint Threat Emitter
JTFEX	Joint Task Force Exercise

K

KD	Known Distance
KTA	Kahuku Training Area

L

LACM	Land Attack Cruise Missile
LARCS	Low Altitude Radio Communication System
LASDT	Low Altitude Step-Down Training
LATT	Low Altitude Tactical Training
LCAC	Landing Craft Air Cushion
LCE	Logistics Combat Element
LEIA	Legislative Environmental Impact Statement
LFAM	Live Fire and Maneuver
LFS	Lead Free Slug
LGB	Laser Guided Bomb
LGTR	Laser Guided Training Round
LMR	Land Mobile Radio
LOA	Letter of Agreement
LOG	Logistics
LRAM	Land Rehabilitation and Maintenance Support
LSNOA	Long Shoal Naval Ordnance Area
LVC	Live, Virtual, Constructive

LVC-IA	Live, Virtual, Constructive - Integrating Architecture
LZSO	Landing Zone Safety Officer

M

M&S	Modeling and Simulation
MAEWR	Mid-Atlantic Electronic Warfare Range
MAGTF	Marine Air Ground Task Forces
MANPADS	Man Portable Air Defense System
MARSOC	Marine Special Operations Command
MCA	Military Construction, Army
MCAGCC	Marine Corps Air Ground Combat Center
MCAS	Marine Corps Air Station
MCAT	Mission Compatibility Analysis Tool
MCB	Marine Corps Base
MCBQ	Marine Corps Base Quantico
MCI	Marine Corps Installation
MCICOM	Marine Corps Installations Command
MCIPAC	Marine Corps Installations Pacific
MCM	Mine Countermeasures
MCLB	Marine Corps Logistics Base
MCoE	Maneuver Center of Excellence
MCON	Military Construction
MCRD	Marine Corps Recruit Depot
MCRP	Mission Capable Ranges Program
MCSCP	Marine Corps Service Campaign Plan
MDA	Missile Defense Agency
MDLP	Multiple District Litigation Plan
MEF	Marine Expeditionary Force
MEU	Marine Expeditionary Unit
MFTL	Mojave Fringed-Toed Lizard
MGS	Mojave Ground Squirrel
MILCON	Military Construction

MILES	Multiple Integrated Laser Engagement System
MIRC	Marianas Islands Range Complex
MITT	Mariana Islands Test and Training
MLRS	Multiple Launch Rocket System
MLT	Mobile Land Target
MMPA	Marine Mammal Protection Act
MOA	Military Operations Area
MOU	Memorandum of Understanding
MOUT	Military Operations in Urban Terrain
MPF	Maritime Prepositioning Force
MPMGR	Multi-Purpose Machine Gun Range
MPRC	Multi-Purpose Range Complex
MPTR	Multi-Purpose Training Range
MRES	Mobile Reprogrammable Emitter Simulator
MRT	Mitigation Response Team
MSL	Mean Sea Level
MTE	Modular Threat Emitter
MTR	Military Training Route
MTX	Mountain Exercise
MW	Mine Warfare

N

NAF	Naval Air Facility
NAS	National Airspace System
NAS	Naval Air Station
NASWI	Naval Air Station Whidbey Island
NAVAIR	Naval Air Systems Command
NAWCWPNS	Naval Air Warfare Center Weapons Division
NAWDC	Naval Air Warfare Development Command
NAWS	Naval Air Weapons Station
NBC	Naval Base Coronado
NCR	National Capital Region
NDAA	National Defense Authorization Act
NDCBR	Navy Dare County Bombing Range

NDSA	Naval Defensive Sea Area
NECC	Navy Expeditionary Combat Command
NEPA	National Environmental Policy Act
NEW	Net Explosive Weight
NFO	Navy Flight Officer
NGB	National Guard Bureau
NGO	Non-Governmental Organization
NM	Nautical Mile
NMFS	National Marine Fisheries Service
NMS	National Marine Sanctuary
NOCAL	Northern California Range Complex
NOTMAR	Notice to Mariners
NRCS	Natural Resources Conservation Service
NSAWC	Naval Strike and Air Warfare Center
NSFS	Naval Surface Fire Support
NSW	Naval Special Warfare
NSWC	Naval Special Warfare Command
NTA	Northern Training Area
NTC	National Training Center
NTTR	Nevada Test and Training Range
NUWC	Naval Undersea Warfare Center
NVD	Night Vision Devices
NWDA	Northwest Development Area
NWSTF	Naval Weapons Systems Training Facility
NWTRC	Northwest Training Range Complex

O

O&M	Operations and Maintenance
OCS	Outer Continental Shelf
ODJ	Oki Daito Jima
OEA	Office of Economic Adjustment
OEIS	Overseas Environmental Impact Statement
OITACA	Off-Installation Transit Axis and Corridor Analysis
OLF	Outlying Field

OMA	Operations and Maintenance, Army
OMCM	Organic Mine Countermeasure
OOS	Ocean Observing System
OPAREA	Operational Area
OPFOR	Opposing Force
OPNAV	Office of the Chief of Naval Operations
OPNAVINST	Office of the Chief of Naval Operations Instruction
OPSEC	Operations Security
OPTEMPO	Operations Tempo
ORC	Operational Range Clearance
OSD	Office of the Secretary of Defense
OSS	Operations Support Squadron
OTB	Over the Beach

P

PA	Programmatic Agreement
PACAF	Pacific Air Forces
PACNORWEST	Pacific Northwest
PACOM	U.S. Pacific Command
PAR	Portable Acoustic Range
PB	President's Budget
PCMS	Pinyon Canyon Maneuver Site
PEO-STRI	Program Executive Officer – Simulation, Training, and Instrumentation
PERSTEMPO	Personnel Tempo
PGM	Precision Guided Munitions
PIRA	Precision Impact Range Area
PMC	Procurement Marine Corps
PMP	Pilot Mitigation Project
PMRF	Pacific Missile Range Facility
PNW	Pacific Northwest
POI	Programs of Instruction
POM	Program Objective Memorandum
POTFF	Preservation of the Force and Families
PPBE	Planning, Programming, Budgeting, and Execution

PPM	Pacific Pocket Mouse
PSUA	Permanent Special Use Airspace
PTA	Pohakuloa Training Area
PTP	Pre-deployment Training Plan
PTR	Primary Training Range
PUTR	Portable Underwater Training Range

Q

QTR	Qualification Training Range
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R

R&D	Research and Development
RA	Restricted Airspace
RANS	Range Squadron
RASP	Recovery and Sustainment Program
RC	Reserve Component
RCB	Reserve Craft Beach
RCC	Range Control Center
RCD	Required Capabilities Document
RCMP	Range Complex Management Plan (Navy/Marine Corps)
RCMP	Range Complex Master Plan (Army)
RCTC	Regional Collective Training Capability
RCW	Red-Cockaded Woodpecker
RDT&E	Research, Development, Test, and Evaluation
RECCE	Reconnaissance
REPI	Readiness and Environmental Protection Integration
RF	Radio Frequency
RFA	Radio Frequency Authorization
RFMS	Radio Frequency Monitoring System
RFMSS	Range Facility Management Support System
RHIB	Rigid Hulled Inflatable Boat
RIMPAC	Rim of the Pacific
RMO	Range Management Office

RMT	Realistic Military Training
ROD	Record of Decision
ROS	Range Operations Support
ROV	Remotely Operated Vehicle
ROW	Right of Way
RPA	Remotely Piloted Aircraft
RSC	Range Support Craft
RSO	Range Safety Officer
RTA	Range and Training Area
RTKN	Real Time Kill Notification
RTLA	Range Training Land Assessment
RTO	Range Training Officer
RWR	Radar Warning Receiver

S

SADL	Situational Awareness Data Link
SAM	Surface to Air Missile
SARSA	Small Arms Range Safety Area
SASC	Senate Armed Services Committee
SCI	San Clemente Island
SCIRC	San Clemente Island Range Complex
SCORE	Southern California Offshore Range
SDB	Small Diameter Bomb
SDS	Spectrum Dependent Systems
SDZ	Surface Danger Zone
SEA	Southern Expansion Area
SEAD	Suppression of Enemy Air Defenses
SERE	Survival, Evasion, Resistance, and Escape
SERPPAS	Southeast Regional Partnership for Planning and Sustainability
SESAMS	Special Effects Small Arms Marking System
SFARP	Strike Fighter Advanced Readiness Program
SFRA	Special Flight Rules Area
SHOBA	Ship-to-Shore Bombardment Area
SHPO	State Historic Preservation Office

SIMCAS	Simulated Close Air Support
SIPRNET	Secure Internet Protocol Router Network
SLATE	Secure LVC Advanced Training Environment
SLTE	Service-Level Training Exercise
SMWDC	Surface and Mine Warfighting Development Center
SNTC	Standard Navy Target Control
SOAR	Special Operations Aviation Regiment
SOCAL	Southern California Offshore Range Complex
SOF	Special Operations Forces
SOUC	Special Operations in Urban Combat
SOW	Special Operations Wing
SPAWAR	Space and Naval Warfare Systems Command
SRI	Sustainable Ranges Initiative
SRM	Sustainable Readiness Model
SRR	Sustainable Ranges Report
SRTA	Short Range Training Ammunition
SSTC	Silver Strand Training Complex
STS	Special Tactics Squadron
STW	Strike Warfare
SUA	Special Use Airspace
sUAS	Small Unmanned Aircraft System
SUBGRU	Submarine Group
SUBPAC	Commander, Submarine Forces, Pacific Fleet
SUW	Surface Warfare
SWAG	Shock Wave Action Generator
SWCC	Special Warfare Combatant Crewman
SWTR	Shallow Water Training Range
SYSKOM	Systems Command (Navy)

T

T&E	Test and Evaluation
T&R	Training and Readiness
TACTS	Tactical Air Combat Training System

TAD	Temporary Additional Duty
TC	Training Circular
TCTS	Tactical Combat Training System
TDA	Table of Distribution and Allowances
TENA	Test and Training Enabled Architecture
TEST	Threatened and Endangered Species Team
TFR	Terrain Following Radar
TGM	Tactical Ground Mobility
TIP	Tactical Interference Point
TR	Training Requirement
TRA	Training Reserve Airspace
TRADOC	U.S. Army Training and Doctrine Command
TSMR	Training Support Management Review
TSPI	Time Space Position Information
TSS	Training Support System
TSUA	Temporary Special Use Airspace
TSWG	Technical Support Working Group
TTP	Tactics, Techniques, and Procedures
T/TSNS	Test and Training Space Needs Statement
TW	Test Wing
TYCOM	Type Commander

U

UAS	Unmanned Aircraft System
UFR	Unfinanced Requirement
UHF	Ultra-High Frequency
ULT	Unit Level Training
UMMCA	Unspecified Minor Military Construction
UMTE	Unmanned Threat Emitter
UNDET	Underwater Detonation
USACE	U.S. Army Corps of Engineers
USAG-HI	U.S. Army Garrison, Hawaii

USAJFKSWCS	U.S. Army John F. Kennedy Special Warfare Center and School
USARAK	U.S. Army Alaska
USASOC	U.S. Army Special Operations Command
USC	United States Code
USD(P&R)	Under Secretary of Defense for Personnel and Readiness
USDA	U.S. Department of Agriculture
USFF	U.S. Fleet Forces Command
USFJ	U.S. Forces Japan
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USMC	U.S. Marine Corps
USSOCOM	U.S. Special Operations Command
USW	Undersea Warfare
USWTR	Undersea Warfare Training Range
UTC	Urban Training Complex
UTR	Undersea Training Range
UTTR	Utah Test and Training Range
UUS	Unmanned Underwater Systems
UXO	Unexploded Ordnance

V

VACAPES	Virginia Capes
VBSS	Visit, Board, Search, and Seizure
VEC	Valued Environmental Component
VEMS	Virtual Exercise Mine
VFR	Visual Flight Rules
VSW	Very Shallow Water
VTC	Video Teleconference

W

WDZ	Weapon Danger Zone
WEA	Western Expansion Areas
WG	Wing

Appendix B: Abbreviation List

WGS	Washington Ground Squirrel
WMA	Wildlife Management Area
WRP	Western Regional Partnership
WSA	Weapons Storage Area
WSMR	White Sands Missile Range
WTI	Weapons Training Instruction

Y

YTC	Yakima Training Center
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SUSTAINABLE RANGES